

04517275

WPI Acc No: 1986-020619/198603

Agglomerated cellulosic particles mfr. - from moist fibrous blend in horizontal rotating drum, compacting particle surface and drying

Patent Assignee: KIMBERLY CLARK CORP (KIMB)

Inventor: HARKE F W; JOHNSON R L; SOKOLOWSKI R C

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4560527	A	19851224	US 84603391	A	19840424	198603 B

Priority Applications (No Type Date): US 84603391 A 19840424

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 4560527	A	10		

Abstract (Basic): US 4560527 A

Cellulosic particles are made by: (a) forming individual agglomerated particles from a moist blend of fibres, aggregates and/or fibre sized pieces of a fibrous cellulosic material in a horizontal rotating drum; (b) compacting the particles' surface to form a densified skin free of protruding fibrils; (c) drying the particles. After step (b), the particles may be partially dried to a 30-50 wt.% moisture content, formed into platelets and then dried to a moisture content of 10 wt.% or less, pref. 5 wt.%.

USE/ADVANTAGE - The particles are esp. useful as an *animal* litter and are light, dust free, absorbent, easy to clean up and wick away free liquid and allow absorbed moisture to evaporate to *prevent* bacterial growth. Other uses include floor sweeping material, packing material, *mulch*, or carrier for *scents*, disinfectants and germicides.

0/4

Derwent Class: D22; F09

International Patent Class (Additional): B29C-067/02

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5/7/4 (Item 1 from file: 347)
DIALOG(R) File 347:JAPIO
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06459590
BIODEGRADABLE MULCHING SHEET

PUB. NO.: 2000-045164 [JP 2000045164 A]
PUBLISHED: February 15, 2000 (20000215)
INVENTOR(s): MATSUNAGA ATSUSHI
YOSHIDA NORIHISA
APPLICANT(s): UNITIKA LTD
APPL. NO.: 10-207655 [JP 98207655]
FILED: July 23, 1998 (19980723)

ABSTRACT

PROBLEM TO BE SOLVED: To obtain a mulching sheet having excellent light-shielding property an air-permeability and exhibiting biodegradability to enable easy disposal by forming a sheet composed of a specific polylactate-based mass-colored filament.

SOLUTION: The objective biodegradable mass-*colored* filament-*mulching* sheet has a single fiber fineness of ≤ 15 de, an areal density of the sheet of 10-50 g/m², a translucency of $\geq 20\%$, an air-permeability of 100-800 cc/cm²/sec and a strength retention [(S₁/S₀) $\times 100\%$] (S₁ is a tensile product of specimen irradiated for 300 hr; S₀ is a tensile product of specimen before irradiation)] of $\geq 50\%$ determined by weather resistance test using a weather meter. The sheet can be produced from a poly(D-lactic *acid*), poly(L-lactic *acid*), a copolymer of D-lactic *acid* and L-lactic *acid*, a copolymer of D-lactic *acid* and a hydroxycarboxylic *acid*, a copolymer of L-lactic *acid* and a hydroxycarboxylic *acid* or their blended product by adding a crystal nucleation agent such as talc and a pigment such as carbon black to the polymer and forming a sheet by spun-bonding method.

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17/7/1 (Item 1 from file: 350)

DIALOG(R)File 350:Derwent WPIX
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013541273

WPI Acc No: 2001-025479/200104

Degradable agricultural ground-covering film

Patent Assignee: UNIV JILIN (UYJI-N)

Inventor: CUI X; TIAN Y

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
CN 1243850	A	20000209	CN 99108160	A	19990628	200104 B

Priority Applications (No Type Date): CN 99108160 A 19990628

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
CN 1243850	A		C08L-099/00	

Abstract (Basic): CN 1243850 A

A degradable agricultural *mulching* film with sepiu *coloumt* is made up of natural marsh soil containing high content of organic matter or peat and degradable binder and additive, and features no environmental pollution, adding nutrients to land and improving soil.

Dwg.0

Derwent Class: A97

International Patent Class (Main): C08L-099/00

International Patent Class (Additional): C08J-005/18

17/7/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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013086561 **Image available**

WPI Acc No: 2000-258433/200023

Mulch having surface coating, specifically colored coating, providing e.g. improved weathering resistance and decorative and pest repellent effects

Patent Assignee: BIOKOMP VERW GES MBH (BIOK-N)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 29919224	U1	20000330	DE 99U2019224	U	19991102	200023 B

Priority Applications (No Type Date): DE 99U2019224 U 19991102

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
DE 29919224	U1	11	C09K-017/52	

Abstract (Basic): DE 29919224 U1

NOVELTY - A mulch has an at least partially coated surface.

USE - The mulch is used as ground cover and/or decoration, e.g. in horticulture or landscape gardening or for marking airport runways, footpaths etc.

ADVANTAGE - Coatings improve the weathering resistance and inhibit rotting of bark mulch, to eliminate the expense of frequent application of fresh *mulch*. By using *colored* coatings the *mulch* is made more easily visible (useful e.g. in improving safety on application to airport runways). *Colored* coatings on *mulches* also deter settling of insects and other small creatures (providing an ecologically harmless method of pest control and plant protection), and can give

additional decorative effects in gardens etc.

DESCRIPTION OF DRAWING(S) - The figure shows a section of a bark mulch piece.

Bark mulch piece (1)

Surface (2)

Color pigment area (3)

Natural resin soap layer (4)

pp; 11 DwgNo 1/1

Derwent Class: A97; C04

International Patent Class (Main): C09K-017/52

International Patent Class (Additional): C09K-017/40; C09K-101-00

17/7/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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012550727 **Image available**

WPI Acc No: 1999-356833/199930

Synthetic mulch material for playgrounds, and edgings for lawns

Patent Assignee: GREENBERG L M (GREE-I); SMITH J A (SMIT-I)

Inventor: GREENBERG L M; SMITH J A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5910514	A	19990608	US 97953824	A	19971001	199930 B

Priority Applications (No Type Date): US 97953824 A 19971001

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 5910514	A	4	C08J-011/04	

Abstract (Basic): US 5910514 A

NOVELTY - Synthetic mulch material which is designed, dimensioned, and coloured to look like natural mulch, is comprised of rubber particles and a water based acrylic colorant

DETAILED DESCRIPTION - Synthetic mulch is comprised of:

(A) a number of rubber particles having an outer surface designed and dimensioned to look like natural mulch and consisting of pea gravel, wood chips, and tree bark, length of 1/16 - 8 inches, and a width of 1/16 - 2 inches, with rubber consisting of natural and synthetic polymers; and

(B) a water based acrylic colorant added to 3 - 10 wt.% rubber particles.

INDEPENDENT CLAIMS are also included, comprising:

(1) A method for forming synthetic mulch comprising:

(a) shredding rubber to form a number of rubber particles between 1/4 - 4 inches in size;

(b) adding water based acrylic colorant to shredded rubber particles; and

(c) mixing thoroughly to form *coloured* synthetic *mulch*.

(2) A method of forming synthetic mulch using vulcanised rubber comprising:

(a) shredding vulcanised rubber to form a number of rubber particles having an outer surface with a bark-like texture, length of 1/16 - 8 inches, and width of 1/16 - 2 inches; and

(b) colouring the shredded vulcanised rubber particles with *colorant* to imitate natural *mulch*.

USE - The synthetic mulch is used for playgrounds, placed around trees and bushes or used as edgings to enhance appearance of lawns.

ADVANTAGE - The *coloured* synthetic *mulch* prevents weed growth, forms a surface that is softer than the ground, does not have sharp edges, and can be coloured so that the surface is of a colour desirable

to the user.

DESCRIPTION OF DRAWING(S) - Figure 1 shows a cross-sectional view of a synthetic wood chip designed to imitate natural ground wood chip mulch.

pp; 4 DwgNo 1/2

Derwent Class: A14; A95; A97; P13

International Patent Class (Main): C08J-011/04

International Patent Class (Additional): A01G-013/02

17/7/4 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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012335776 **Image available**

WPI Acc No: 1999-141883/199912

Mixing solid pieces with liquid for coating and colouration of landscaping materials - by using motor-driven mixing auger positioned in liquid filled chamber which rotates to intermix liquid and pieces and conveying pieces towards outlet with first flight, with second flight reducing packing

Patent Assignee: BLUE D (BLUE-I)

Inventor: BLUE D

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5866201	A	19990202	US 96650871	A	19960520	199912 B

Priority Applications (No Type Date): US 96650871 A 19960520

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 5866201	A	12	B05D-007/00	

Abstract (Basic): US 5866201 A

The method involves disposing a number of solid pieces such as wood chips in a chamber (70) defining an outlet, the chamber including a motor-driven auger (120) with a first spiral flight (124) and a second spiral flight (128), at least a portion of the second flight being positioned over the outlet and having a rotational orientation opposite the first flight. Liquid is placed in the chamber. The liquid is composed of a concentrated water-based colourant and water

The auger is turned with a preferably electrically powered motor (92) to intermix the solid pieces and the liquid within the chamber, convey the solid pieces toward the outlet with the first flight, and reduce packing of the solid pieces at the outlet with the second flight. The solid pieces are then discharged through the outlet (74).

USE - For producing landscaping *mulch*, such as *coloured* wood chips or rocks.

ADVANTAGE - Provides mixer which resists packing yet still economically imparts uniform colour to landscaping materials.

Dwg.3/5

Derwent Class: P42

International Patent Class (Main): B05D-007/00

17/7/5 (Item 5 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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011962897 **Image available**

WPI Acc No: 1998-379807/199833

Double black-*coloured* *mulching* paper for agricultural use - comprising a substrate with both sides coloured by adding urea/starch

phosphate to both sides

Patent Assignee: HOKUYO SEISHI KK (HOKU-N)

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 10117605	A	19980512	JP 96294631	A	19961017	199833	B
JP 2881727	B2	19990412	JP 96294631	A	19961017	199920	

Priority Applications (No Type Date): JP 96294631 A 19961017

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

JP 10117605 A 9 A01G-013/00

JP 2881727 B2 8 A01G-013/00 Previous Publ. patent JP 10117605

Abstract (Basic): JP 10117605 A

Double black-*coloured* *mulching* paper opt. with holes consists of a substrate consisting of paper of a basis wt. of 50-150 g/m², a sizing degree of 80-120 sec, an air resistance of 30-120 sec, a density of 0.3-0.8 cm³, a longitudinal breaking length of 2.8-5.6 km and a light transmissivity of 0-5% imparted with an elongation of at least 5% through fluting, embossing or cramping. Both sides of the substrate are coloured by adding 1-15 wt.% of urea/starch phosphate to the sides. Also claimed is double black *coloured* *mulching* paper composed of a substrate consisting of the paper additionally containing 0.1-3.5 wt.% of a polymer with both sides of the substrate coloured by addn. of 1-15 wt.% of urea/starch phosphate.

USE - The paper is used as agricultural mulching paper in cold areas.

ADVANTAGE - The prods. ensure sufficient soil temps. in cold areas, avoid troubles associated with polymers such as polymer burn and environmental pollution associated with plastic waste, and eliminate the need of removal after harvest.

Dwg.1/2

Derwent Class: F09; P13

International Patent Class (Main): A01G-013/00

International Patent Class (Additional): D21H-027/00

17/7/6 (Item 6 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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009400288 **Image available**

WPI Acc No: 1993-093797/199311

Colouring agent applicator for ground wood chips - has chips fed into screw conveyor to contact colouring agent before being drawn out by auger rotation

Patent Assignee: KURTZ BROS INC (KURT-N)

Inventor: RONDY G J

Number of Countries: 037 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9303862	A1	19930304	WO 92US7352	A	19920821	199311	B
US 5192587	A	19930309	US 91749141	A	19910823	199312	
AU 9225654	A	19930316	AU 9225654	A	19920821	199328	

Priority Applications (No Type Date): US 91749141 A 19910823

Cited Patents: SU 617083; US 4337720; US 4932156

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 9303862 A1 E 14 B05D-007/06

Designated States (National): AT AU BB BG BR CA CH CS DE DK ES FI GB HU
JP KP KR LK LJ MG MN MW NL NO PL RO RU SD SE

Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL
 OA SE
 US 5192587 A 7 B05D-007/06
 AU 9225654 A B05D-007/06 Based on patent WO 9303862

Abstract (Basic): WO 9303862 A

Comminuted wood is fed into the lower end of an upwardly angled screw conveyor (10) which has an internal auger (14). The wood is contacted by a liq. colour-imparting agent, after which rotation of the auger draws the moist coloured wood towards the conveyor upper end.

Runoff of excess liq. agent returns by gravity to a basin at the conveyor lower end for further contacting newly fed wood. The basin liq. level is monitored and maintained. Coloured wood product discharges through a chute (26) at the conveyor upper end for further drying, if necessary.

USE/ADVANTAGE - Colouring agent applicator provides aesthetically pleasing mulch material to compete favourably with bark mulches on market and allows waste lumber to be used, eliminating need for landfill disposal.

Dwg.1/2

Abstract (Equivalent): US 5192587 A

To colour wood chips, includes feeding the comminuted wood into an angularly upwardly positioned screw conveyor having a solid helical auger disposed axially within in close fitting relation to the internal surface of a closed cylindrical channel at its lower first end inlet port, driving the wood chips up along the conveyor by rotation of the auger, supplying aq. colouring soln. to a lower basin portion of the conveyor for colouring the wood chips therein, allowing the wood chips to drain as they pass up the conveyor and discharging the moist coloured wood chips from the upper outlet port of the conveyor.

USE/ADVANTAGE - Used as *mulch*. Provides dark *coloured* *mulch* similar to bark chips.

Dwg.1/2

Derwent Class: P42

International Patent Class (Main): B05D-007/06

International Patent Class (Additional): B05C-011/10

17/7/7 (Item 7 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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007733921

WPI Acc No: 1988-367853/198851

Method of making dark, uniformly-*coloured*, hardwood *mulch* - involves forming mass of large-fibre hardwood pulp and passing through mass to sufficiently saturate until dark colour is obtained

Patent Assignee: ZEAGER C B (ZEAG-I)

Inventor: ZEAGER B C

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4788790	A	19881206	US 86871326	A	19860606	198851 B

Priority Applications (No Type Date): US 86871326 A 19860606

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 4788790	A	3		

Abstract (Basic): US 4788790 A

The method of making a dark, uniformly-*coloured* hardwood *mulch* comprises of forming a mass of large-fibred, hardwood pulp consisting essentially of 20-100% by weight of large-fibred hardwood bark pulp,

and 0-80% by weight of large-fibred hardwood wood pulp, most of the large fibres being acicular. Then passing water through the mass in an amount in excess of that sufficient to saturate said mass. Recycling excess water through the mass until a substantially uniform, dark colour is obtained.

Oxidation plays a part in procucing the dark colour and improving the rot resistance of the mulch. The large-fibred bark pulp is just about the same colour as the large-fibred wood pulp when the pile of fibres is first formed and before water recycling has taken and the pile is worked over and mixed by handling equipment, preferably a bulldozer.

ADVANTAGE - Not only does such handling increase the darkening, doubtless by further oxidation, but it renders the entire mass more uniformly coloured by admixing any lighter and darker regions

Derwent Class: P13

International Patent Class (Additional): A01G-007/00

17/7/8 (Item 8 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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004627380

WPI Acc No: 1986-130723/198620

Appts. forming seed mat - applies fertiliser and seeds with paper and glue interlayers to mulch layer

Patent Assignee: GAUGHEN T P (GAUG-I)

Inventor: GAUGHEN T P

Number of Countries: 002 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4584790	A	19860429	US 84668890	A	19841106	198620 B
AU 8549095	A	19860515				198627

Priority Applications (No Type Date): US 84668890 A 19841106

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 4584790	A	10		

Abstract (Basic): US 4584790 A

Appts. comprises a conveyor passing a mulch applicator, a glue sprayer, a fertiliser distributor, a station placing paper over the layer, a second glue sprayer applying a light layer on the paper, a distributor applying seeds evenly onto the glue layer, a second station placing further paper over the layer, a hot drying tunnel and a cutter severing sections from the mat.

The glue is pref. polyvinylacetate, and the fertiliser contains P at 0.5-1 lb/1000 ft². The glue is sprayed at an air pressure of 10-25 lb/in², and the paper is less than 20 lb wt., smooth-surfaced, biodegradable and of colour contrasting with seed *colour*. The *mulch* applicator comprises a bin with a second conveyor in a bottom opening to move straw onto the first conveyor, and an adjacent toller to compact the straw.

ADVANTAGE - The seeds are properly distributed and well protected in a strong mat, with a good mulch cover

Derwent Class: A97; C03; P11; P73

International Patent Class (Additional): A01C-001/04; B32B-031/00

17/7/9 (Item 9 from fil : 350)

DIALOG(R)File 350:Derwent WPIX

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001879113

WPI Acc No: 1978-A8342A/197804

Mulch formed of paper fibres - with liquid mixt. sprayed onto fibres inside rotary drum

Patent Assignee: THOMAS J C (THOM-I)

Inventor: THOMAS J C

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4067140	A	19780110				197804 B

Priority Applications (No Type Date): US 76674555 A 19760407

Abstract (Basic): US 4067140 A

A mulch is produced by coating a quantity of finely divided fibres of paper with a wetting agent. Pref. the wetting agent is mixed with a liquid or solvent such as water and contacted with the fibres by spraying the liquid mixture into a rotating drum in which the fibres of paper are tumbled.

Pref., the fibres are also contacted with a dye to provide paper *mulch* with a pleasing colour, such as green. The fibres of paper absorb the liquid mixture, coating them with the wetting agent which increases the ability of the paper mulch to be mixed with a suspended in water. A mixture of paper mulch and water can be discharged in a stream onto soil with a suitable appts.

Derwent Class: P13

International Patent Class (Additional): A01G-007/00

17/7/10 (Item 1 from file: 344)

DIALOG(R)File 344:CHINESE PATENTS ABS

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4213849

DEGRADABLE AGRICULTURAL GROUND-COVERING FILM

Patent Assignee: UNIV JILIN (CN)

Author (Inventor): XIANGHAO CUI (CN); YUANYI TIAN (CN)

Number of Patents: 000

Patent Family:

CC Number	Kind	Date
CN 1243850	A	20000209 (Basic)

Application Data:

CC Number	Kind	Date
*CN 99108160	A	19990628

Abstract: A degradable agricultural mulching film with sepia colour is made up of natural marsh soil containing high content of organic matter or peat and degradable binder and additive, and features no environmental pollution, adding nutrients to land and improving soil.

17/7/11 (Item 1 from file: 347)

DIALOG(R)File 347:JAPIO

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06484283

MULCHFILM FOR AGRICULTURE

PUB. NO.: 2000-069861 [JP 2000069861 A]

PUBLISHED: March 07, 2000 (20000307)

INVENTOR(s): TSUNODA KUNIHIKO

APPLICANT(s): MIKADO KAKO KK

APPL. NO.: 10-257565 [JP 98257565]

FILED: August 27, 1998 (19980827)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a *colored* *mulch* film for agriculture that is made hydrophilic on its inner surface to increase the propagation effect of the algae and can inhibit the weeds from growing under the film by solving the contradictory problems that algae are promoted their propagation, but other weeds are inhibited from growing despite that both of algae and weeds are activated with the same photosynthesis by the sun.

SOLUTION: The objective mulch film is characterized by including 1-10 wt.% of wet-oxidized ferric oxide. In a preferred embodiment, the wet-oxidized ferric oxide is an α -Fe₂O₃ that has $\geq 95\%$ ferric oxide purity, a spherical shape with an average particle size of 0.14-0.21 μm and a pH of 5.0-7.5.

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17/7/12 (Item 2 from file: 347)

DIALOG(R) File 347:JAPIO
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05834505

BOTH SIDE BLACK *COLORED* *MULCHING* PAPER

PUB. NO.: 10-117605 [JP 10117605 A]

PUBLISHED: May 12, 1998 (19980512)

INVENTOR(s): TAKATANI TAKESHI
OOTANI TAKENOSUKE
TOMITA MASAMITSU

APPLICANT(s): HOKUYOU SEISHI KK [000000] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 08-294631 [JP 96294631]

FILED: October 17, 1996 (19961017)

ABSTRACT

PROBLEM TO BE SOLVED: To obtain the product which is suitable for field working in cold climate areas, is capable of ensuring the covering period necessary for growth of agricultural products and is decomposable by corrosion after harvesting of the agricultural products.

SOLUTION: The material formed by using paper (more adequately kraft paper, etc.) having a rice weighing of 50 to 150g/m², sizing degree of 80 to 120 seconds, air permeability of 30 to 120 seconds, density of 0.3 to 0.8cm³ and tearing length in a longitudinal direction of 0 to 5%, and imparting elongatability of $\geq 5\%$ by fluting, embossing or crimping to this paper is used as a base material. Urea and starch phosphate are incorporated at 1 to 15wt.% into both front and rear surfaces of this base material to color these surfaces. More preferably, the front surface is coated or impregnated with a coating material prepared by using urea and starch phosphate as a binder and coloring this binder with black carbon and the rear surface is coated or impregnated with a coating material prepared by adding potassium iodide to the same binder and coloring the binder by iodine starch reaction, respectively. A polymer, such as polyvinyl alcohol, at 0.1 to 3.5wt.% is preferably incorporated into the base material.

17/7/13 (Item 3 from file: 347)

DIALOG(R) File 347:JAPIO
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04573754

MULCH PAPER HAVING--*COLORED* ONE SIDE AND ITS PRODUCTION

PUB. NO.: 06-245654 [JP 6245654 A]
PUBLISHED: September 06, 1994 (19940906)
INVENTOR(s): YOSHIGA YOSHINOBU
APPLICANT(s): SANYO SEISHI KK [000000] (A Japanese Company or Corporation),
JP (Japan)
APPL. NO.: 05-053218 [JP 9353218]
FILED: February 19, 1993 (19930219)

ABSTRACT

PURPOSE: To obtain a general purpose mulch paper having ready handleability by biodegradation free from pollution by coloring only one side of paper

CONSTITUTION: Only one side of paper comprising wood pulp or another cellulose fiber as a base is colored in <=10% Hunter whiteness and only one side of the paper is made to readily absorb sunlight. When the colored face is turned to the surface, weeds are effectively suppressed and when the noncoloring face is turned to the surface, rise in soil temperature is effectively subdued.

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      (c) 1998 BCPC
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
      (c) 1998 Inst for Sci Info

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Set	Items	Description
S1	1136856	(COLOR? OR COLOUR? OR DYED OR PIGMENT? OR TINT OR TINTED OR TINTS)
S2	144358	FRAGRANC? OR PERFUM? OR SCENT? OR ODOR? OR ODOUR? OR FRAGRANT? OR SMELL?
S3	7074707	DETER? OR PROHIBIT? OR DISSUAD? OR PREVENT? OR DISCOURAG?
S4	12052333	DETERMIN? OR DETECT? OR MEASUR?
S5	8642938	ACID? OR CONDITION? OR MOISTUR?
S6	15548159	DEER? OR ANIMAL? OR BEAR? OR GOPHER? OR VARMINT? OR GOAT?
S7	1939722	SOIL OR SOILS
S8	33985	MULCH?
S9	6008	(S7 OR S8)(3N)(S1 OR S2)
S10	295080	S4(3N)S5
S11	39668	S3(3N)S6
S12	0	S9 AND S10 AND S11
S13	113	S9 AND (S10 OR S11)
S14	80	RD (unique items)
S15	791086	(COLOR OR COLORED OR COLOUR? OR COLORING OR DYED OR PIGMENT? OR TINT OR TINTED OR TINTS OR TINTING)
S16	3761	S15(3N)(S7 OR S8)
S17	50	S16 AND (S10 OR S11)
S18	33	RD (unique items)
S19	33	S18 NOT PD=000223:011106

19/7/1 (Item 1 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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12839380 BIOSIS NO.: 200100046529

Process of humus formation in some natural mountains ecosystems.

AUTHOR: Pachev I(a)
 AUTHOR ADDRESS: (a)Fodders Institute, Pleven**Bulgaria
 JOURNAL: Nauka za Gorata 36 (1-2):p61-68 1999
 MEDIUM: print
 ISSN: 0861-007X
 DOCUMENT TYPE: Article
 RECORD TYPE: Abstract
 LANGUAGE: Bulgarian; Non-English
 SUMMARY LANGUAGE: English

ABSTRACT: During the period 1996 - 1997 a study was carried out amount of main components of organic matter of Dystric cambisols (brown forest soil) and Umbric cambisols (mountain forest dark-*coloured* *soil*) along profile line off the Danube up to the ridge of the Balkan Mountains. Absolute and relative amounts of true humic substances, detritus and plant residues were determined. Microflora amount in million/l g soil was determined. For the Dystric cambisols (brown forest soil) the ratio Cha:Cfa was 1.23 in spite of shortening of biologically active period, change of steppe with forest vegetation and acid soil-forming scale. This was explained by the very good aeration *determining* oxidation *conditions* during the greatest part of biologically active period and rather possible participation of lignin fragments in humus synthesis mainly in a chemical way. Umbric cambisols (mountain-forest dark-*coloured* *soil*) under Spruce and virgin had very high values of Cha:Cfa 1.91 and 3.43 respectively in spite of very short period of biological activity and low microbiological intensity. This soil, as well as the brown forest soil was aerated very well, but humic acid nature differed considerably from that of chernozems. Formation of humic acids from lignin fragments was supposed in a purely chemical way without slight participation of microorganisms. The total amount of microorganisms was highest for the Dystric cambisols (brown forest soil) (195.50 million/l g soil for virgin) followed by the Beech forest and lowest for leaf bedding (105.90 million/l g soil). For Humic cambisols (mountain forest dark-*coloured* *soil*) of the total amount of microorganisms was highest in the soil under fir-tree 75.4 mln/l g soil followed by the variant with leaf bedding and lowest 30.0 mln/l g soil for the virgin variant (grass vegetation). For both soils bacteria amount was the highest followed by oligonitrophiles, cellulolytic and actinomycetes.

19/7/2 (Item 2 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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10751231 BIOSIS NO.: 199799372376

Effects of surface *conditions* on organic matter *measurements* of a soil sensor.

AUTHOR: Elliott Paul W; Haghghi Kamyar(a); Krutz Gary W
 AUTHOR ADDRESS: (a)Dep. Agricultural Biological Engineering, Purdue Univ., West Lafayette, IN 47907**USA
 JOURNAL: Computers and Electronics in Agriculture 16 (1):p21-38 1996
 ISSN: 0168-1699
 RECORD TYPE: Abstract
 LANGUAGE: English

ABSTRACT: A set of experiments was conducted to examine the effects of soil

surface roughness and surface color discontinuities on a real-time soil organic matter sensor. The purpose of such a soil sensor is to accurately measure soil properties; thus providing information that can be used to set chemical and fertilizer application rates. After examining several chemical application labels it was determined that 1% organic matter error should be considered significant in data used for controlling chemical application. It was hypothesized that soil surface roughness and surface color discontinuities might produce significant errors in the prediction of soil organic matter levels. The effects of surface roughness were examined at two different sensor elevations relative to the average height of the sample profile. Sensor measurements in response to color discontinuities, to approximate non-decomposed plant matter, during calibration procedures was examined. Color discontinuities with a width of 3.0 mm were found to produce measurement errors of more than 6.0% soil organic matter content. It was also found that rough surfaces can produce significantly low organic matter measurements during field use. Both error sources produce artificially low organic matter measurements during field use, while this does reduce the yield potential of a field, it also reduces the potential for water contamination. Calibration samples should be free of all non-decomposed plant matter, and as smooth as possible to prevent artificially high organic matter measurements. Rough samples or samples with non-decomposed plant matter, used during the calibration procedure would result in too much chemicals being applied to a field, increasing water contamination potential.

19/7/3 (Item 3 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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08919932 BIOSIS NO.: 199396071433

**Studies on allelopathic interactions among some grassland species: IV.
Observation of the allelopathic interaction between *Lolium perenne* L. and
Trifolium repens L. grown in soil culture.**

AUTHOR: Takahashi Yoshitaka(a); Otani Ichiro(a); Uozumi Sunao; Igarashi Ryozo; Hagino Kouji(a)

AUTHOR ADDRESS: (a)Chugoku Natl. Agric. Exp. Station, Oda, Shimane 694**
Japan

JOURNAL: Journal of Japanese Society of Grassland Science 38 (4):p478-486
1993

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: Japanese; Non-English

SUMMARY LANGUAGE: Japanese; English

ABSTRACT: Allelopathic characteristics of *Lolium perenne* L. have been previously reported in sand culture. The objectives of this study were: (i) to confirm if allelopathic interference of *Trifolium repens* by *Lolium perenne* might exist under soil culture *conditions*, and (ii) to *determine* the toxic effects of soil previously planted with *Lolium perenne*. The results obtained are summarized as follows: 1..In intercropping experiment on *soil* (red-yellow *color* clay loam), plant growth of *Trifolium repens* was apparently inhibited by associating with *Lolium perenne*, showing the greater inhibition at the higher proportion of *Lolium* in mixture. *Lolium perenne* showed the opposite response, growing better in association with *Trifolium repens* (experiment 1). 2. Growth of *Lolium perenne* and *Trifolium repens* was generally found to be reduced in soil in which *Lolium* plants had been grown previously (*Lolium-soil*); whereas in the soil where *Trifolium* plants had been planted (*Trifolium-soil*), there was benefit effect in stimulating the plant growths of both species (experiment 2). 3. Methanol extracts from *Lolium* soil and *Trifolium* soil caused a reduction in seedling growth of *Trifolium repens* in bioassay; showing the greater inhibition in *Lolium*

soil compared with Trifolium soil (experiment 3). 4. From these results, it is suggested that allelopathic mechanism may occur in the interference of Trifolium repens by Lolium perenne in soil culture that involves the exudation of allelochemicals from root of Lolium plants.

19/7/4 (Item 4 from fil : 5)

DIALOG(R)File 5:Biosis Previews(R)
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08317488 BIOSIS NO.: 000094079811

SEASONALLY SATURATED SOILS IN THE PUGET LOWLAND I. SATURATION REDUCTION AND COLOR PATTERNS

AUTHOR: COGGER C G; KENNEDY P E

AUTHOR ADDRESS: WASHINGTON STATE UNIV. PUYALLUP RESEARCH EXTENSION CENTER,
7612 PIONEER WAY E., PUYALLUP, WASH. 98371-4998.

JOURNAL: SOIL SCI 153 (6). 1992. 421-433. 1992

FULL JOURNAL NAME: Soil Science

CODEN: SOSCA

RECORD TYPE: Abstract

LANGUAGE: ENGLISH

ABSTRACT: The depth and duration of seasonal saturation are important factors affecting land use and management decisions. Soil chromas < 2 have been used to indicate the depth of seasonal saturation, but in many soils this relationship is not valid. This study was conducted to determine the relationships among seasonal saturation, *soil* *color* patterns, and *soil* redox in soils derived from glacial till, alluvium, and volcanic mudflow material in the Puget Sound Lowland of western Washington [USA]. Soil profiles were described at key positions on landscapes typical of each parent material. Water tables, soil redox potentials, ground water dissolved oxygen (DO), and soil *moisture* tensions were *measured* in selected soil horizons and the results compared with *soil* *color* patterns. Seasonal high water tables could be predicted using chroma 2 colors on the glacial till and volcanic mudflow landscapes. Soil colors did not appear to indicate current redox conditions in the alluvial sites, although they could be used to predict seasonal high water tables on the oewash plain landscape. The duration of DO levels < 5 mg/L could be related to soil redox status. Soil horizons with DO < 5 mg/L for more than 80% of the time they were saturated had low soil redox potentials and were clearly reduced for at least part of the year. Soil horizons with DO < 5 mg/L for 60-80% of the time were reduced only in microsites. Other soil horizons remained oxidized throughout the year.

19/7/5 (Item 5 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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05148904 BIOSIS NO.: 000081107029

SIMULTANEOUS *DETERMINATION* OF *MOISTURE* ORGANIC CARBON AND TOTAL NITROGEN BY NEAR IR REFLECTANCE SPECTROPHOTOMETRY

AUTHOR: DALAL R C; HENRY R J

AUTHOR ADDRESS: QUEENSLAND WHEAT RESEARCH INST., P.O. BOX 5282, TOOWOOOMBA 4350, AUSTRALIA.

JOURNAL: SOIL SCI SOC AM J 50 (1). 1986. 120-123. 1986

FULL JOURNAL NAME: Soil Science Society of America Journal

CODEN: SSSJD

RECORD TYPE: Abstract

LANGUAGE: ENGLISH

ABSTRACT: Near infrared diffuse reflectance spectrophotometry, within the

wavelength range 1100 to 2500 nm, was investigated for use in the simultaneous prediction of the moisture, organic C, and total N contents of air-dried soils. An infraAlyzer 500 C (Technicon Instruments Corp.) scanning spectrophotometer was used to obtain near infrared reflectance of soils at 2-nm intervals. Calibration equations for each of the soil constituents studied were based upon selection of the best combination of 3 wavelengths in a multiple regression analysis. The wavelengths selected for moisture, organic C, and total N, respectively, were 1926, 1954, and 2150 nm, 1744, 1870 and 2052 nm, and 1702, 1870 and 2052 nm. The standard errors of prediction for finely ground samples (< 0.25 mm) from the top layers (0-0.1, 0.1-0.2, 0.2-0.3, 0.3-0.6 m) were 0.58, 0.16, and 0.014% for moisture, organic C, and total N, respectively. The standard errors of prediction, however, were much larger for coarsely ground soils (< 2 mm), soils containing low amounts of organic C (< 0.3%) and total N (< 0.03%), and for those with a wide range in colors. Within a narrow range in *soil* *color* and at moderate amounts of organic matter (0.3-2.5%), the near infrared reflectance technique provides a rapid, nondestructive, and simultaneous *measurement* of *moisture*, organic C and total N in soils.

19/7/6 (Item 6 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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05064824 BIOSIS NO.: 000081022948
SPROUT REGENERATION OF ULMUS-PUMILA IN THE SEMI-DESERT OF THE NORTHERN CASPIAN SEA REGION USSR
 AUTHOR: OLOVYANNIKOVA I N
 AUTHOR ADDRESS: LAB. FOR., ACAD. SCI. USSR, USPENSKOYE, USSR.
 JOURNAL: LESOVEDENIE 0 (3). 1985. 26-34. 1985
 FULL JOURNAL NAME: Lesovedenie
 CODEN: LESOA
 RECORD TYPE: Abstract
 LANGUAGE: RUSSIAN

ABSTRACT: A positive correlation of elm sprout regeneration growth and longevity with the size of paddings, *determining* forest-vegetational *conditions*, and nutrition area has been revealed. The state of trees before felling is reflected in the sprout growth and its longevity. The sprout from trees, crowns of which are dry by more than a half, is less long-lived. In the Caspian semi-desert even on dark-*coloured* *soils* of paddings, where fresh groundwater is within the reach for elm roots, the nutrition area of 5-6 m² is rather small for the 7-9 year-old sprout resulting in stag headedness and reducing the increment.

19/7/7 (Item 7 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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04659697 BIOSIS NO.: 000079072734
A SIMPLE COLORIMETRIC *MEASUREMENT* FOR HUMIC *ACIDS* IN SPODIC HORIZONS
 AUTHOR: HOLMGREN G G S; HOLZHEY C S
 AUTHOR ADDRESS: NATIONAL SOIL SURVEY LAB., MNTC, SCS, USDA, LINCOLN, NEBR. 68508.
 JOURNAL: SOIL SCI SOC AM J 48 (6). 1984 (RECD. 1985). 1374-1378. 1984
 FULL JOURNAL NAME: Soil Science Society of America Journal
 CODEN: SSSJD
 RECORD TYPE: Abstract
 LANGUAGE: ENGLISH

ABSTRACT: An organic buffer, 2-amino-2-methyl propanol neutralized to pH 10

with 4 M acetic acid, was investigated as an extractant for *soil* organic matter. The *color* of the humic acid fraction of this extract proved to be a distinctive marker of spodic horizon organic matter. Both the humic acid and fulvic acid fractions were quantified by a simple comparator used to classify color in natural waters. The fulvic acid color was functionally related to Al in the extract and also to Al in the pyrophosphate extract. If the extract contained Fe, it was associated with the humic acid color, although humic acid color could be present without Fe. The humic acid color was present only in those soils with pH < 4.5. Data are presented to demonstrate the ruggedness of the procedure with respect to variations of extraction time and of the soil/solution ratio.

19/7/8 (Item 8 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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04311923 BIOSIS NO.: 000078041466

AN ANTIBIOTIC *PIGMENT* FROM A PHILIPPINE *SOIL* ACTINOMYCETE 2. ISOLATION AND CHEMICAL CHARACTERIZATION

AUTHOR: SEVILLA-SANTOS P

AUTHOR ADDRESS: ACTA MANILANA, RES. CENT., UNIV. SANTO TOMAS, MANILA D-403, PHILIPPINES.

JOURNAL: ACTA MANILANA SER A NAT APPL SCI 0 (22). 1983 (RECD. 1984). 31-61. 1983

CODEN: AMNIB

RECORD TYPE: Abstract

LANGUAGE: ENGLISH

ABSTRACT: A brick-red antibiotic (SA-15)4 was produced by a natural variant of *Streptomyces parvus* Philippine strain isolated from Philippine *soil*. The antibiotic *pigment* complex was obtained from the broth and mycelium by adsorption with activated clay at pH 3.0. Extraction was effected by acetone. The acetone extract was extracted with ethyl acetate and concentrated. A bright yellow precipitate was obtained by precipitation with petroleum ether. Chromatography on an alumina column gave major band and 3 other components. Chromatography over a silicic acid-celite column of the major band gave 2 antibiotically active pigmented components (SA-15)4 and (SA-15)3. Fraction (SA-15)4 was characterized by its physical and chemical properties, TLC, bioautography and UV and IR spectroscopy. Based on the absorption characteristics the compound was classified as belonging to the actinomycin group. Elementary analysis gave a molecular formula of C₆₄H₉₂O₁₈N₁₂ with a MW of 1011 (Rast method). Other tests which strongly indicated its similarity or identity to actinomycin D were the UV *measurements* in neutral, *acidic* and alkaline solutions, hydrolysis under mild conditions and amino acid analysis. Valine, n-methyl valine, sarcosine, threonine and proline were present upon hydrolysis of the compound. The compound was very active against gram-positive bacteria and mycobacteria.

19/7/9 (Item 9 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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03221800 BIOSIS NO.: 000071034911

A COMPARISON OF METHODS OF DETERMINING AMMONIA AND NITRATE IN SOILS

AUTHOR: GERLACH A

AUTHOR ADDRESS: UNIV. GOETTINGEN, UNTERE KARSPUELE 2, 34 GOETTINGEN, W. GER.

JOURNAL: ACTA OECOL OECOL PLANT 1 (2). 1980. 185-200. 1980

FULL JOURNAL NAME: Acta Oecologica Oecologia Plantarum

CODEN: AOSPD
 RECORD TYPE: Abstract
 LANGUAGE: GERMAN

ABSTRACT: Three different methods for the determination of ammonia-N are described and compared, the colorimetric method with Berthelot's reaction, the determination with the ammonia-sensitive electrode, and the *determination* with dilute *acid* after microdistillation. All methods are highly sensitive and the agreement is good. Special instructions are given for application to other materials like water samples or *colored* *soil* extracts. Three different methods for the determination of nitrate-N in soil extracts (nitrite absent) are compared with the microdistillation method after reduction with Devarda's reagents: with UV-spectroscopy, with nitrate-sensitive electrode, with the xlenol method. The agreement with the microdistillation method is good. Methods for special applications like water samples or *colored* *soil* extracts are described.

19/7/10 (Item 1 from file: 6)

DIALOG(R)File 6:NTIS
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0333392 NTIS Accession Number: N72-24927/XAB

Soviet Robots on the Moon

Podolskiy, A. D.
 Translation Consultants, Ltd., Arlington, Va.
 Report No.: NASA-TT-F-14300
 Jun 72 16p
 Document Type: Translation
 Journal Announcement: GRAI7216; STAR1015
 Tran- Transl. Into English From Weltraumfahrt Raketentech., V. 22, Oct. - Nov. 1971 P 171-175
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 Contract No.: NASW-2038

Luna 16 explored the Sea of Fertility in 1970, for age, type of *soil*, *color*, density, etc. *Soil* samples were returned to earth for study for the first time, and confirmed that the plains were flooded by lava. Lunokhod 1, landed by Luna 17 in November 1970, confirmed the theory of the formation of the lunar crust by its experiments near the edge of the western section of Mare Imbrium. Lunokhod 1, a self-propelled laboratory on wheels, explored over 10 km over a period of 10 months prior to ceasing operation. Experiments ranged from *determining* *bearing* capacity of the surface, mechanical properties, and soil analysis, to the study of the decrease in the intensity of cosmic radiation, proton eruptions, X-ray radiation, the exploration of distant regions of space by X-ray telescope, and joint experiments with the French with a laser reflector. (Author)

19/7/11 (Item 1 from file: 10)

DIALOG(R)File 10:AGRICOLA
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3873554 22075227 Holding Library: AGL

Factors affecting color-based weed detection

El-Faki, M.S. Zhang, N.; Peterson, D.E.
 St. Joseph, Mich. : American Society of Agricultural Engineers 1958-
 Transactions of the ASAE. July/Aug 2000. v. 43 (4) p. 1001-1009.
 ISSN: 0001-2351 CODEN: TAAEAJ

DNAL CALL NO: 290.9 Am32T

Language: English

Includes references

Place of Publication: Michigan

Subfile: IND; OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);

Document Type: Article

Color differences between weeds and crops have been used to develop an image-based sensor to detect weeds in wheat and soybean fields for post-emergency herbicide spot spray. Several field factors were found to affect the correct-classification rate (CCR) of the sensor. CCR is defined as the ratio between the number of weed-stem pixels correctly classified and the total number of weed-stem pixels in an image. The first factor was soil moisture content. Images of weeds and soil at 10 different moisture contents were analyzed using a statistical method. It was found that, within a large variation range of soil moisture content, the values of relative *color* indices of *soil* varied within a sufficiently narrow range, which did not seriously overlap with the range for weed stems. As a result, variations in soil moisture content did not cause significant misclassification between soil and weeds. The second factor was illumination. Images of standard RGB primary-color plates were taken at nine different illumination intensities. The effect of illumination on color indices was found significant. However, the variation ranges of the relative color indices on images of the color plates did not overlap, and the variations of the index values followed noticeable patterns, which could be used in color-index calibration. The third factor studied was spatial resolution. Nine different spatial resolutions of weed images were achieved by taking images at different camera-plant distances. The optimum resolution, at which the CCR was maximized, was found to be about 0.5 mm. The classifier was tested on field images obtained under natural lighting *conditions*. The classifier detected 28-day old yellow foxtail and redroot pigweed with CCRs of 40.2% and 54.9%, respectively. The misclassification rate (MCR), which was defined as the ratio between the number of non-weed stem pixels misclassified as weed stem and the total number of non-weed stem pixels, was below 0.2% for both weed species.

19/7/12 (Item 2 from file: 10)

DIALOG(R)File 10:AGRICOLA

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3369622 20395268 Holding Library: AGL

Monitoring surface changes of bare soils due to slaking using spectral measurements

Courault, D. Bertuzzi, P.; Girard, M.C.

[Madison, Wis.] Soil Science Society of America.

Soil Science Society of America journal. Nov/Dec 1993. v. 57 (6) p. 1595-1601.

ISSN: 0361-5995 CODEN: SSSJD4

DNAL CALL NO: 56.9 So3

Language: English

Includes references

Place of Publication: Wisconsin

Subfile: IND; OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);

Document Type: Article

The structural degradation of the soil surface due to rainfall makes the surface more susceptible to erosion. Loamy soils are particularly vulnerable to slaking, seal development, and crusting. The sealing process occurs in different stages. This study examined the possibility of using visible and near-infrared reflectances for detecting these surface changes due to rainfall, and for defining optimal *conditions* for spectral *measurements*. Experimentation was conducted under field-controlled conditions using a SPOT satellite simulation radiometer. Radiometric measurements were made at three solar altitudes: 0600, 1200, and 1800 h

GMT, at five different stages of surface degradation following simulated rainfall. Ground measurements consisting of Munsell color, water content, and surface roughness were made simultaneously to characterize surface changes. The influence of these various factors on reflectance was analyzed. Soil water was the main source of variation in reflectance, while surface roughness was a factor of secondary importance. Reflectance increased with increased roughness and decreased soil water content. A combination of red and near-infrared reflectances made it possible to identify different soil lines according to soil water content, solar angle, and slaking stage. Optimal conditions for monitoring surface changes were those where the solar altitude is the lowest for dry soils. Different slaking stages can also be detected by reflectances performed at 1200 h under dry conditions.

19/7/13 (Item 3 from file: 10)

DIALOG(R)File 10:AGRICOLA

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2996363 90028620 Holding Library: AGL

Reflected far-red light effects on chlorophyll and light-harvesting chlorophyll protein (LHC-II) contents under field conditions

Bradburne, J.A. Kasperbauer, M.J.; Mathis, J.N.

Georgia Institute of Technology, Atlanta, GA

Rockville, Md. : American Society of Plant Physiologists.

Plant physiology. Nov 1989. v. 91 (3) p. 800-803.

ISSN: 0032-0889 CODEN: PLPHA

DNAL CALL NO: 450 P692

Language: English

Includes references.

Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);

Document Type: Article

The influence of various colors of soil cover (mulch) on the far-red/red (FR/R) ratio in upwardly reflected light and on concentrations of chlorophyll (Chl) and light-harvesting Chl protein (LHC-II) were *measured* under field *conditions*. The FR/R ratios above green surfaces were higher than over white surfaces. Even though plants (*Gossypium hirsutum* L. cv PD-1) were grown in full sunlight, those that received higher FR/R ratios in upwardly reflected light were taller and had thinner leaves with higher concentrations of Chl and LHC-II. A controlled environment experiment showed FR/R control of Chl and LHC-II concentrations. The results illustrate the importance of spectral distribution of reflected light on plant growth and a potential means of altering the chemistry of leaf crops under field conditions.

19/7/14 (Item 4 from file: 10)

DIALOG(R)File 10:AGRICOLA

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2578725 86052721 Holding Library: AGL

Sensors utilizing light reflection to measure soil organic matter

Pitts, M.J. Hummel, J.W.; Butler, B.J.

St. Joseph, Mich. : The Society.

Transactions of the ASAE - American Society of Agricultural Engineers.

Mar/Apr 1986. v. 29 (2) p. 422-428. ill.

ISSN: 0001-2351 CODEN: TAAEA

DNAL CALL NO: 290.9 AM32T

Language: English

Includes 17 references.

Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);

Document Type: Article

19/7/15 (Item 1 from file: 34)
 DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
 (c) 2001 Inst for Sci Info. All rts. reserv.

02790146 Genuine Article#: MD665 Number of References: 35
Title: CANDIDATE HIGH-SPECTRAL-RESOLUTION INFRARED INDEXES FOR CROP COVER
 Author(s): MALTHUS TJ; ANDRIEU B; DANSON FM; JAGGARD KW; STEVEN MD
 Corporate Source: UNIV WOLVERHAMPTON,SCH APPL SCI/WOLVERHAMPTON WV1
 1SB//ENGLAND//; UNIV NOTTINGHAM,SCH AGR,DEPT PHYSIOL &
 ENVIRONMSCI/LOUGHBOROUGH LE12 5RD/LEICS/ENGLAND//; INRA/F-78850
 THIVERVAL GRIGNON//FRANCE//; UNIV SALFORD,DEPT GEOG/SALFORD M5
 4WT/LANCS/ENGLAND//; BROOMS BARN EXPTL STN/BURY ST EDMUNDS IP28
 6NP/SUFFOLK/ENGLAND//; UNIV NOTTINGHAM,DEPT GEOG/NOTTINGHAM NG7
 2RD//ENGLAND/
 Journal: REMOTE SENSING OF ENVIRONMENT, 1993, V46, N2 (NOV), P204-212
 ISSN: 0034-4257
 Language: ENGLISH Document Type: ARTICLE
 Abstract: The sensitivity of near-infrared / red ratio vegetation indices
 to *soil* reflectance and plant *color* result in ambiguous
 interpretation of plant *condition* and productivity. *Measurements* of
 the reflectance of crop canopies were made at high spectral resolution
 to investigate candidate vegetation indices, in the near- and
 middle-infrared (800-2500 nm), for their ability to unambiguously
 estimate foliage cover independently of the extraneous effects of
 variations in canopy *color* and *soil* background brightness.
 Reflectances were measured with an IRIS spectroradiometer over plots of
 sugar beet (*Beta vulgaris* L.) sown on different dates and at different
 densities to produce a wide range in canopy cover. Vegetation color was
 varied by infecting selected plots with sugar beet yellows virus. Soil
 brightness was varied by placing trays of peat between the plant rows.
 Selected narrow-band near- and middle-infrared reflectances were tested
 for their relationship with canopy cover and their sensitivity to
 variations in canopy *color* and *soil* brightness. The relationship
 between canopy cover and traditional near-infrared / red ratio indices
 was found to be sensitive to both canopy *color* and *soil* brightness.
 Most infrared indices were insensitive to the effects of canopy color,
 but those showing the highest correlations with cover tended to be
 significantly influenced by soil brightness. The most promising NIR
 reflectances were those beyond the range (760-900 nm) of near-infrared
 reflectance detected by current space-borne systems, such as Landsat TM
 and SPOT HRV.

19/7/16 (Item 1 from file: 50)
 DIALOG(R)File 50:CAB Abstracts
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03802768 CAB Accession Number: 992302602
Development of a spectral-based weed sensor.
 Wang Ning; Zhang NaiQian; Sun YuRui; Peterson, D. E.; Dowell, F. E.
 Biological and Agricultural Engineering Department, Kansas State
 University, Kansas State University, USA.
 ASAE/CSAE-SCGR Annual International Meeting, Toronto, Ontario, Canada,
 18-21 July, 1999.
 Conference Title: ASAE/CSAE-SCGR Annual International Meeting, Toronto,
 Ontario, Canada, 18-21 July, 1999.
 9 pp.
 Publication Year: 1999
 ASAE Paper No. 993037
 Publisher: American Society of Agricultural Engineers (ASAE) -- St
 Joseph, USA
 Language: English

Document Type: Conference paper

A spectral-based weed sensor was designed based on spectral characteristics of crops, weeds and *soil*. Light-insensitive *colour* indices were developed. The sensor was tested under laboratory *conditions*. The *detection* accuracy for wheat, soil and weeds (downy brome (*Bromus tectorum*), field bindweed (*Convolvulus arvensis*), Kochia sp., flixweed (*Descurainia sophia*), shepherd's purse (*Capsella bursa-pastoris*), redroot pigweed (*Amaranthus retroflexus*), jointed goatgrass (*Aegilops cylindrica*), field pennycress (*Thlaspi arvense*), Japanese brome (*B. japonicus*) and Russian thistle (*Salsola iberica*)) reached 98.68%, 98.26% and 64.29%, respectively. 14 ref.

19/7/17 (Item 2 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

03127429 CAB Accession Number: 950712176

Candidate high spectral resolution infrared indices for crop cover.

Malthus, T. J.; Andrieu, B.; Danson, F. M.; Jaggard, K. W.; Steven, M. D.

Department of Physiology and Environmental Science, School of Agriculture, University of Nottingham, Loughborough, UK.

Remote Sensing of Environment vol. 46 (2): p.204-212

Publication Year: 1993

ISSN: 0034-4257 --

Language: English

Document Type: Journal article

The sensitivity of near-IR:red ratio vegetation indices to *soil* reflectance and plant *colour* result in ambiguous interpretation of plant *condition* and productivity. *Measurements* of the reflectance of sugarbeet canopies were made at high spectral resolution to investigate candidate vegetation indices, in the near- and middle-IR (800-2500 nm), for their ability to estimate foliage cover independently of the extraneous effects of variations in canopy *colour* and *soil* background brightness. Reflectances were measured with an IRIS spectroradiometer over plots of sugarbeet sown on different dates and at different densities to produce a wide range in canopy cover. Vegetation colour was varied by infecting selected plots with sugar beet yellows virus (beet yellows closterovirus). Soil brightness was varied by placing trays of peat between the plant rows. Selected narrow-band near- and middle-IR reflectances were tested for their relationship with canopy cover and their sensitivity to variations in canopy *colour* and *soil* brightness. The relationship between canopy cover and traditional near-IR:red ratio indices was found to be sensitive to both canopy *colour* and *soil* brightness. Most IR indices were insensitive to the effects of canopy colour, but those showing the highest correlations with cover tended to be significantly influenced by soil brightness. The most promising near-IR reflectances were those beyond the range (760-900 nm) of near-IR reflectance detected by current space-borne systems, such as Landsat TM and SPOT HRV. 35 ref.

19/7/18 (Item 3 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

02764911 CAB Accession Number: 931982039

Significance of organic matter in determining soil colors.

Schulze, D. G.; Nagel, J. L.; Scoyer, G. E. van; Henderson, T. L.; Baumgardner, M. F.; Stott, D. E.

Purdue University, West Lafayette, Indiana, USA.

Conference Title: Soil color: proceedings of a symposium, San Antonio,

Texas, 21-26 October 1990

p.71-90

Publication Year: 1993

Editors: Bingham, J.M.; Ciolkosz, E.J.

Publisher: Soil Science Society of America, Inc. -- Madison, WI, USA

ISBN: 0-89118-802-9

Price: \$25.00

Language: English

Document Type: Conference paper

Quantitative relationships between *soil* *colour* and organic matter content are only poorly understood, but they are of considerable practical importance in mapping and classifying soils, interpreting soil properties, and in designing sensors for agricultural equipment. The colour-organic matter relationships for Ap horizons from Indiana and Illinois soils were studied to test the hypothesis that Munsell value and organic matter content are more closely related for soils occurring together in soil landscapes than for soils over a wide geographical region. Two sample sets were collected. Sample set 1 consisted of 105 Ap horizons from throughout Indiana, while set 2 consisted of 10 to 15 Ap horizons from each of 16 landscapes in Indiana and Illinois. Organic matter content was determined by dry combustion, and Munsell colours of both moist and dry samples were calculated from reflectance spectra. The relationship between Munsell value and organic matter content: (i) was poor for Indiana soils statewide (sample set 1); (ii) was predictable ($r^2 > 0.9$) within soil landscapes if soil textures did not vary widely; (iii) was linear within landscapes with silty and loamy textured soils but was curvilinear within landscapes with sandy-textured soils; (iv) was similar among landscapes having the same soil textures and parent materials; and (v) was not predictable if soil texture varied widely (sands vs. silts and loams) within the landscape. In a separate study, the colours of various organic and inorganic fractions from the Ap horizons of four Indiana soils were *measured*. The purified humic *acid* content was about 15 times the purified fulvic acid content for all four soils. The black humic acid, which masked the yellowish brown colour of the fulvic acid, was responsible for the dark *colour* of the *soil* organic matter. 37 ref.

19/7/19 (Item 4 from file: 50)

DIALOG(R) File 50:CAB Abstracts

(c) 2001 CAB International. All rts. reserv.

02437520 CAB Accession Number: 911957340

Humus composition of soils at Mt. Taishan in China and of several major soils in Japan.

Xi, Y. F.; Oba, Y.; Tomikawa, A.; Higashi, T.

Shandong Agric. Univ., China.

Pedologist vol. 34 (2): p.119-127

Publication Year: 1990

ISSN: 0031-4064 --

Language: Japanese Summary Language: english

Document Type: Journal article

Humus composition of several soils in China and Japan was studied. Soil samples were taken from Entic Brunisolic soil, Orthic Brunisolic soil, Mountain Dark-Brown soil and Mountain Shrubby-Meadow soil at Mt. Taishan in China and also from Light-*coloured* Andosol, Red-Yellow *soil* and Acid Brown Forest soil in Japan. Humus were extracted from the soils with 0.5% NaOH and a mixture of 0.5% NaOH and 0.1M Na4P2O7 (1:1). Humus composition was determined by the Kobo and Oba method, and visible-ultraviolet absorption spectra of humic *acids* *measured*. The types of humic acids extracted from Light-*coloured* Andosol, Red-Yellow *soil* and Acid Brown Forest soil were A, Rp and P Type, resp. But the humic acids extracted from the soils at Mt. Taishan were all Rp, and humification was weak. 4 ref.

19/7/20 (Item 5 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

02275993 CAB Accession Number: 901945470

Characteristics and classification of red, black and yellow soils of Rajmahal Trap of Bihar.

Tiwary, J. R.; Jha, P. P.; Mishra, B. B.
Dep. Soil Sci. and Agric. Chem., Bihar Agric. College, Sabour,
Bhagalpur, Bihar 813210, India.

Journal of the Indian Society of Soil Science vol. 37 (3): p.518-523

Publication Year: 1989

ISSN: 0019-638X --

Language: English

Document Type: Journal article

Red, black and yellow *coloured* *soils* occur in topographical sequence in the Rajmahal Trap of Bihar. Various morphological, physicochemical and chemical properties of these soils indicate that the topographical situation associated with different moisture and drainage *conditions* was instrumental in *determining* soil characteristics. Red soils are Alfisols, while black soils are Inceptisols, Vertisols, Entisols and Alfisols. The yellow soils are Inceptisols. 5 ref.

19/7/21 (Item 6 from file: 50)

DIALOG(R)File 50:CAB Abstracts
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02211071 CAB Accession Number: 901940966

Determination of molecular weights of humic *acids* by osmotic pressure *measurement* and by permeation chromatography on controlled pore glass.

Tsutsuki, K.; Kuwatsuka, S.

Fac. Agric., Nagoya Univ., Chikusa-ku, Nagoya, 464-01 Japan.

Soil Science and Plant Nutrition vol. 35 (3): p.393-403

Publication Year: 1989

ISSN: 0038-0768 --

Language: English

Document Type: Journal article

Number-average molecular weights (Mn) of humic *acids* (HAs) were *determined* by osmometry and by permeation chromatography on controlled pore glass with a pore size of 500 Å . Mn values of dialyzed HAs tended to decrease in the order of Rp(2) > Rp(1) > P0 type, and increase in the order of P0 < B < A type. Mn values of non-dialyzed HAs did not show any appreciable differences among the HA types, which was considered to be due to the predominance in the number of species with lower molecular weight (< 10,000) in HAs. Mn values calculated from the permeation chromatograms showed a similar trend to those of Mn obtained by osmometry, but the values differed depending on the detection methods. Ultraviolet absorption gave a smaller value for Mn while the differential refractive index gave a larger value for Mn than that by osmometry. It was shown that both the decrease and increase in the molecular weight takes place during the humification process of HAs; the decrease was considered to be associated with the decomposition of partially decayed bio-polymers and the increase with the formation of a dark *coloured* polymer intrinsic to *soils*. 11 ref.

19/7/22 (Item 7 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

02018311 CAB Accession Number: 881925298

The significance of gley features in soils derived from grey parent materials.

Moffat, A. J.; Jarvis, M. G.

Soil Survey of England and Wales, Rothamsted Experimental Station, Harpenden, Hertfordshire, AL5 2JQ, UK.

Journal of Soil Science, UK vol. 39 (2): p.177-189

Publication Year: 1988

6 fig., 4 tab. --

Language: English

Document Type: Journal article

Detailed observations of gley features in soils derived from grey Upper Greensand rocks have been compared with their *moisture* regimes as *determined* by water-levels in dipwells. There was good correlation between the incidence of grey ped face and matrix colours of low chroma, prominent ochreous mottling within the matrix and duration of waterlogging. Careful examination of soil macromorphology can be used, despite inherent greyness, to assess the drainage status and Wetness Class of these soils. Physical and micromorphological analyses suggest that the wetness of some Upper Greensand soils is due to the combination of low vertical permeability in the underlying rock, and moderate horizontal permeability in the overlying horizons. Such circumstances allow perched water-tables to form in wet weather, sustained by lateral flow when rainfall has ceased. 28 ref.

19/7/23 (Item 1 from file: 94)

DIALOG(R)File 94:JICST-EPlus

(c)2001 Japan Science and Tech Corp(JST). All rts. reserv.

03111123 JICST ACCESSION NUMBER: 97A0301425 FILE SEGMENT: JICST-E

A simple diagnostic method for measuring inorganic nitrogen concentration in the soil of a field of 'TOYONOKA' strawberries. (2). A simple measuring method for inorganic nitrogen concentration in soil.

INOUE KEIKO (1); YAMAMOTO TOMIZO (1); SUENOBU SHINJI (1)

(1) Fukuoka Agricultural Res. Center

Fukuokaken Nogyo Sogo Shikenjo Kenkyu Hokoku(Bulletin of the Fukuoka Agricultural Research Center), 1997, NO.16, PAGE.39-43, FIG.7, TBL.2, REF.14

JOURNAL NUMBER: Y0232BAG ISSN NO: 1341-4593

UNIVERSAL DECIMAL CLASSIFICATION: 635.1/.8 631.41/.43

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

ABSTRACT: This report describes a simple measuring method for inorganic nitrogen concentration in the soil of 'TOYONOKA' strawberries taking appropriate control of fertilizer application by diagnosing the concentration in real time during its growing period. After a minimum of two weeks of fertilizer application and when the inorganic nitrogen concentration in a field was less than 15mg/100g, approximately 90% of the inorganic nitrogen was nitrate nitrogen. For the sake of accuracy and simplicity, it is, therefore, considered appropriate that the soil inorganic nitrogen concentration is estimated by a concentration of nitrate in water extracts from soil samples measured by nitrate test paper. The appropriate procedure for extracting water from soil was as follows: field moist soil and water (1:2.5 or 1.5) were mixed in a polyethylene vessel first, then shaken by hand off and on for 10 minutes, and finally filtrated. As for the measuring method for nitrate concentration in water extracted from *soil*, measuring the *color* tone of test paper by a portable reflection photometer showed high accuracy. Measuring the color tone of the test paper by the color scale was inexpensive but the accuracy was low to some degree. The color

scale method can be used when the concentration is less than 100ppm. The value of the soil *moisture* *measured* two or three days after watering could be used as a constant when nitrate concentration in water extracted from soil was measured, because the values did not vary much during the growing period. (author abst.)

19/7/24 (Item 2 from file: 94)

DIALOG(R)File 94:JICST-EPlus
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01439290 JICST ACCESSION NUMBER: 92A0133266 FILE SEGMENT: JICST-E

Effect of afforestation on characteristics of Ando soil.

TAMURA KENJI (1); NAGATSUKA SHIZUO (2); OBA YUTAKA (3)

(1) Univ. of Tsukuba, Sugadaira Montane Res. Center; (2) Kobe Univ., Faculty of Agriculture; (3) Univ. of Tsukuba, Inst. of Applied Biochemistry

Shinrin Ritchi (Japanese Journal of Forest Environment), 1991, VOL.33, NO.2, PAGE.86-91, FIG.7, TBL.4, REF.14

JOURNAL NUMBER: G0591AAZ ISSN NO: 0388-8673

UNIVERSAL DECIMAL CLASSIFICATION: 630*24 631.4

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

ABSTRACT: The physical, chemical and micromorphological properties of surface soils under the tree garden and the nursery garden in Sugadaira Montane Research Center, University of Tsukuba, Central Japan were studied. Species of the four stands in the tree garden were Abies veitchii, Chamaecyparis obtusa, Larix leptolepis and Betula ermanii. Soil was Ando Soil originated from volcanic ash, and the *color* of surface *soil* was black (7.5YR1.7/1) to dark brown (7.5YR3/3). Bulk density of surface soil under Abies and Chamaecyparis stands were 0.33 (g/ml-1), and that in the nursery garden was 0.50 (g/ml-1). The values of 24hr water holding capacity in the tree garden were higher than that in the nursery garden. pH values in the tree garden indicated more acidic than that in the nursery garden. Exchange acidity (Y1) was highest under Abies stand, and lowest in the nursery garden. RF values of humic acid fraction were higher in the nursery garden than in the tree garden. The type of humic *acid* *determined* from absorption spectra was A type except under Chamaecyparis stand. Microstructure of surface soils in the tree garden were crumb and granular structure under Abies and Chamaecyparis stands, and were subangular blocky structure under Larix and Betula stands. Large amounts of plant residues and excrements pedofeatures were found in the thin sections of soil samples under Abies, Chamaecyparis and Betula stands. In the nursery garden, however, those were very few. From these results, it is apparent that properties of surface soils in the tree garden were different from in the nursery garden. These suggest that afforestation affects soil environment, and characteristics of the surface soils vary, and that biological activity in soil under afforested stands is higher than under an upland field such as the nursery garden. (author abst.)

19/7/25 (Item 3 from file: 94)

DIALOG(R)File 94:JICST-EPlus
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01304658 JICST ACCESSION NUMBER: 91A0339329 FILE SEGMENT: JICST-E

Humus composition of soils at Mt. Taishan in China and of several major soils in Japan.

OBA YUTAKA (1); TOMIKAWA AKIO (1); HIGASHI TERUO (1); XIAO Y F (2)

(1) Univ. of Tsukuba, Inst. of Applied Biochemistry; (2) Shandong Agricultural Univ., CHN
 Pedorojisuto(Pedologist), 1990, VOL.34,NO.2, PAGE.119-127, FIG.4, TBL.2,
 REF.4

JOURNAL NUMBER: F0963AAP ISSN NO: 0031-4064

UNIVERSAL DECIMAL CLASSIFICATION: 631.41/.43

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

ABSTRACT: Humus composition of several soils in China and Japan was studied. Soil samples were taken from Entic brunisolic soil, Orthic Brunisolic soil, Mountain Dark-brown soil and Mountain Shrubby-meadow soil at Mt. Taishan in China and also from Light-*colored* Andosol, Red-Yellow *soil* and Acid Brown Forest soil in Japan. Humus were extracted from the soils with 0.5% NaOH and a mixture of 0.5% NaOH and 0.1M Ma4P2O7(1:1). Humus composition analysis was carried out with Kobo and Oba method, and then visible-ultraviolet absorption spectra of those humic *acids* were *measured*. From the results obtained, types of humic acids and their degrees of humification were evaluated. The types of humic acids extracted from Light-*colored* Andosol, Red-Yellow *soil* and Acid Brown Forest soil were A, Rp and P Type, respectively. But, the types of humic acids extracted from the soils at Mt. Taishan in China were all Rp, and it is apparent that the degree of humification were quite low. (author abst.)

19/7/26 (Item 4 from file: 94)

DIALOG(R)File 94:JICST-Eplus

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00693125 JICST ACCESSION NUMBER: 88A0544069 FILE SEGMENT: JICST-E

Skillful cultivation of "Koshihikari", a variety of paddy rice, avoiding a lodging lodging by a diagnosis of nutrient *condition* through an integrated *measurement* of plant growth.

TANNO FUMIO (1)

(1) Fukushima Prefect. Agricultural Exp. Stn.

Nogyo oyobi Engei(Agriculture and Horticulture), 1988, VOL.63,NO.8,
 PAGE.951-957, FIG.11, TBL.7

JOURNAL NUMBER: G0801AAD ISSN NO: 0369-5247 CODEN: NOOEAA

UNIVERSAL DECIMAL CLASSIFICATION: 633.18

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Commentary

MEDIA TYPE: Printed Publication

ABSTRACT: Techniques for nutrient condition diagnosis were investigated to attain a 600kg/10 a yield in the cultivation of "Koshihikari" variety (1). Characteristics of growth of (1) in Fukushima Prefecture were examined to learn an ideal growth pattern of (1) to attain the yield. Methods are explained for prediction and diagnosis of growth of (1) by an integrated measurement of plant length, stem number, leaf *color*, ammonia nitrogen in *soil* and temperature.

19/7/27 (Item 1 from file: 98)

DIALOG(R)File 98:General Sci Abs/Full-Text

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04055569 H.W. WILSON RECORD NUMBER: BGSA99055569 (THIS IS THE FULLTEXT)

The edaphic factor and patterns of variation in Lasthenia californica (Asteraceae).

Rajakaruna, Nishanta

Bohm, Bruce A

- serpentine species of *Streptanthus* (Brassicaceae): field and greenhouse studies. *Madrono* 42: 458-469.
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19/7/28 (Item 1 from file: 117)
 DIALOG(R) File 117: Water Resour.Abs.
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00743112 WRA NUMBER: 9203393

Relation of Cation Exchange Capacity to Clay and Organic Carbon Contents of Indiana Soils

Franzmeier, D P ; Steinhardt, G C ; Brasher, B R

Proceedings of the Indiana Academy of Science PIACAP, Vol. 99, No 1, p 107-112, September, 1990. 2 fig, 1 tab, 8 ref.

1990

DOCUMENT TYPE: Journal article

ABSTRACT: Soil cation exchange capacity (CEC) is a measure of the cations adsorbed on the negative sites of solid particles and is commonly expressed as milliequivalents of positive charge per 100 gm. of soil (me/a00g). Proper soil management requires knowledge of CEC in determining the ability of a soil to retain nutrient cations and to prevent them from getting into the surface or groundwater. CEC has been determined for many soils, but not for many others. Summation of the relationships of CEC to clay and organic matter contents, which are more commonly determined, can be used to predict CEC for soils with no CEC data. CEC was determined at two pH levels. Basic cations (Ca^{++} , Mg^{++} , Na^+ and K^+) were extracted with ammonium acetate solution, and extractable *acidity* was *determined* by the barium chloride-triethanolamine method at a pH of 8.2. All cations in the soil were replaced by NH_4^+ ions and adsorbed NH_4^+ was determined. The base saturation was calculated by dividing the sum of extracted base cations extracted by the ammonium acetate and multiplying the result by 100 to give a percentage. Particle size was determined by the pipette method and organic carbon was determined by wet oxidation. On average for all soils of the state, 100 grams of clay contributes 59 me CEC and 100 grams of organic matter contributes 208 me CEC measured at pH 8.2. This CEC is about 15% higher than the CEC measured at pH 7.0. Soil pH can be used to predict base saturation with moderate accuracy. CEC can also be predicted from *soil* texture and Munsell *color* designation which can be estimated in the field and which are recorded in many soil pedon descriptions. (Doyle-PPT) 35 009058011

19/7/29 (Item 2 from file: 117)

DIALOG(R)File 117:Water Resour.Abs.

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00568036 WRA NUMBER: 7402301

WATER REGIME OF SOLONCHAK SOLONETZES IN OPEN AREAS OF FORESTS IN THE NORTH CASPIAN SEA REGION, (VODNYY REZHIM SOLONCHAKOVYKH SOLONTSOV NA POLYANAKH LESNYKH NASAZHDENIY SEVERNOGO PRIKASIYA)

OLOVYANNIKOVA, I N

POCHVOVEDENIYE, NO 11, P 44-55, 1972. 3 FIG, 5 TAB, 8 REF.

1972

DOCUMENT TYPE: Journal article

ABSTRACT: TO STUDY WATER REGIME OF SOLONCHAK SOLONETZES IN OPEN AREAS OF FORESTS IN THE SEMIDESERT OF THE NORTH CASPIAN SEA REGION, INVESTIGATIONS WERE CARRIED OUT ON VIRGIN SOLONCHAK SOLONETZ AND ON DARK-*COLORED* *SOIL* OF SINKS (1966-69), AND ON SOLONETZES IN OPENINGS BETWEEN TREES PLANTED IN 1952 (1963-68). SOIL *MOISTURE* CONTENT WAS *DETERMINED* TO THE ROOTING DEPTH MONTHLY DURING THE GROWNING SEASON AND TO THE WATER TABLE IN SPRING AND AUTUMN. ADDITIONAL WETTING THROUGH ACCUMULATION OF SNOW ON OPEN AREAS PRODUCED A RADICAL CHANGE IN THE WATER REGIME OF SOLONCHAK SOLONETZES, RESULTING IN DESALINIZATION AND DESOLONETZIZATION OF THESE SOILS. AN INCREASE IN WETTING DEPTH AND SOIL WATER STORAGE IN SPRING CONTRIBUTED TO GROWTH OF A LUXURIANT GRASS COVER ON SOLONETZES IN OPEN AREAS. DEPTH OF ROOTING OF WELL-DEVELOPED PLANTS AND DEPTH OF SOIL DRYING WERE GREATER IN THE OPEN THAN IN VIRGIN SOLONETZ. WATER LOSS FROM OPEN AREAS DURING A GROWING SEASON EXCEEDED THAT FROM VIRGIN SOLONETZES BY A FACTOR OF 1.5-3 AND APPROACHED THE

AMOUNT OF WATER LOST BY STEPPE VEGETATION OF SINKS. (JOSEFSON-USGS)

19/7/30 (Item 3 from file: 117)

DIALOG(R)File 117:Water Resour.Abs.

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00548329 WRA NUMBER: 7213130

VISIBLE AND NEAR INFRARED REMOTE-SENSING OF SOIL MOISTURE LEVELS

SEWELL, J I ; ALLEN, W H ; PILE, R S

TENNESSEE UNIV., KNOXVILLE

TRANSACTIONS AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, VOL 14, NO 6, P
1163-1166, NOV-DEC. 1971. 5 FIG, 4 TAB, 9 REF.

1971

DOCUMENT TYPE: Journal article

ABSTRACT: LABORATORY AND FIELD TESTS USING INFRARED PHOTOGRAPHIC

TECHNIQUES SHOW THAT DETECTING DIFFERENCES IN SURFACE SOIL MOISTURE LEVELS OF FALLOW SOILS IS TECHNICALLY POSSIBLE. A TECHNIQUE FOR EVALUATING THE SOIL MOISTURE LEVELS OF LARGE AREAS WILL BE USEFUL IN LOCATING AREAS NEEDING IMPROVED DRAINAGE AND FOR SCHEDULING IRRIGATION. DIFFERENCES BETWEEN FILM DENSITY AND SURFACE *MOISTURE* WERE *DETECTED* BEST WITH COLOR INFRARED FILM AND WRATTEN NO 15 OR NO 15 PLUS 80B FILM FILTERS. WHILE BLACK-AND-WHITE INFRARED FILM CAN ALSO BE USED TO *DETECT* SURFACE *SOIL* *MOISTURE* DIFFERENCES, *COLOR* INFRARED FILM EXHIBITED GREATER VARIATIONS IN THE TONE ASSOCIATED WITH SOIL MOISTURE DIFFERENCES. VARIATIONS IN OPTICAL DENSITY OF INFRARED PHOTOGRAPHS ARE MORE CLOSELY RELATED TO COLOR AND REFLECTED LIGHT THAN TO THERMAL PROPERTIES. THE PRECISION OF AERIAL INFRARED PHOTOGRAPHIC STUDIES MAY BE ADVERSELY AFFECTED BY VARYING CLOUD COVER, DIFFERENT SUN ANGLES, DIFFERENCES BETWEEN FILM LOTS, AND DIFFERENCES BETWEEN RUNS IN FILM PROCESSING. EVALUATING SOIL MOISTURE LEVELS OF SOILS HAVING HEAVY VEGETAL COVER MAY BE DIFFICULT. (USBR)

19/7/31 (Item 1 from file: 144)

DIALOG(R)File 144:Pascal

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13739458 PASCAL No.: 98-0431946

Preferential flow in a well drained and a poorly drained soil under different overhead irrigation regimes

MCLEOD M; SCHIPPER L A; TAYLOR M D

Landcare Research NZ Ltd. Private Bag 3127, Hamilton, New Zealand

Journal: Soil use and management, 1998, 14 (2) 96-100

ISSN: 0266-0032 CODEN: SUMAEU Availability: INIST-20853;
354000076875450070

No. of Refs.: 22 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: United Kingdom

Language: English

There is environmental concern about the increasing land application of dairy shed effluent in New Zealand. To minimize groundwater contamination by applied nutrients and pathogens it is desirable to avoid preferential flow through topsoils. Our objective was to determine an irrigation rate that retained applied effluent in the topsoil of two commonly irrigated New Zealand soils. In a field experiment, well drained Horotiu soils and poorly drained Te Kowhai soils were irrigated with a pyranine dye/KBr tracer solution at four rates (5, 10, 15, 20 mm/h) using a drip-type rainfall simulator. Twenty minutes after irrigation ceased the soil was excavated horizontally at 25 or 50 mm intervals, and photographed under UV light until no further fluorescence was visible. Each layer was also analysed for bromide content, without subsampling. The wetting pattern was uneven in both soils as leachate moved preferentially through worm channels and

structural cracks. Preferential flow was greatest in the Te Kowhai soil and increased at faster application rates. Dye fluorescence was curvilinearly related to bromide concentration. At both study sites, maintaining the irrigation rate at <= 10 mm/h minimized leachate movement into the subsoil. Pulsed irrigation at faster rates was not retained in the topsoil.

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19/7/32 (Item 2 from file: 144)

DIALOG(R)File 144:Pascal
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09007624 PASCAL No.: 90-0175805

Use of color splitting and a computer technique to separate soil moisture groups

AL-ABED S R; LEWIS D T; SAMSON S A

Univ. Virginia, dep. environmental sci., Charlottesville VA 22903, USA

Journal: Soil Science Society of America Journal, 1989, 53 (6) 1812-1818

ISSN: 0361-5995 CODEN: SSSJD4 Availability: CNRS-6109

No. of Refs.: 16 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: USA

Language: English

19/7/33 (Item 1 from file: 203)

DIALOG(R)File 203:AGRIS
Dist by NAL, Intl Copr. All rights reserved. All rts. reserv.

00999373 AGRIS No: 84-068497

***Measurement* of some *soil* *condition* using the *colour* frame data system**

Taniwaki, K. (Agricultural Research Center, Yatabe, Ibaraki (Japan))

Journal: Soil Physical Conditions and Plant Growth, Apr 1983, (no.47) p. 22-26

Language: Japanese

Place of Publication: Japan

Document Type: Journal Article,

Journal Announcement: 1008 Record input by Japan

?

\$83.82 Estimated total session cost 5.347 DialUnits

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Set     Items    Description
S1     2074646   (COLOR? OR COLOUR? OR DYED OR PIGMENT? OR TINT OR TINTED OR
              TINTS)
S2     420804    FRAGRANC? OR PERFUM? OR SCENT? OR ODOR? OR ODOUR? OR FRAGR-
              ANT? OR SMELL?
S3     5211496   DETER? OR PROHIBIT? OR DISSUAD? OR PREVENT? OR DISCOURAG?
S4     5789589   DETERMIN? OR DETECT? OR MEASUR?
S5     4445879   ACID? OR CONDITION? OR MOISTUR?
S6     3655782   DEER? OR ANIMAL? OR BEAR? OR GOPHER? OR VARMINT? OR GOAT?
S7     666921    SOIL OR SOILS
S8     20549     MULCH?
S9     2384      (S7 OR S8)(3N)(S1 OR S2)
S10    70153     S4(3N)S5
S11    16101     S3(3N)S6
S12    0         S9 AND S10 AND S11
S13    30        S9 AND (S10 OR S11)
S14    29        RD (unique items)
S15    1347394   (COLOR OR COLORED OR COLOUR? OR COLORING OR DYED OR PIGMEN-
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T? OR TINT OR TINTED OR TINTS OR TINTING)
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S18 16 RD (unique items)
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\$291.40 Estimated total session cost 35.377 DialUnits

19/3,K/1 (Item 1 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

03989175 CAB Accession Number: 20003010782

Factors affecting color-based weed detection.

El-Faki, M. S.; Zhang, N.; Peterson, D. E.
Department of Biological, and Agricultural Engineering, Kansas State University, Manhattan, Kansas 66506, USA.

Transactions of the ASAE vol. 43 (4): p.1001-1009

Publication Year: 2000

ISSN: 0001-2351 --

Language: English

Document Type: Journal article

--
... statistical method. Within a large variation range of soil moisture content, the values of relative *colour* indices of *soil* varied within a sufficiently narrow range, which did not seriously overlap with the range for...

... about 0.5 mm. The classifier was tested on field images obtained under natural lighting *conditions*. The classifier *detected* 28-day old yellow foxtail (*Setaria pumila*) and redroot pigweed (*Amaranthus retroflexus*) with CCRs of...

...DESCRIPTORS: *soil* *colour*;

19/3,K/2 (Item 2 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

03802768 CAB Accession Number: 992302602

Development of a spectral-based weed sensor.

Wang Ning; Zhang NaiQian; Sun YuRui; Peterson, D. E.; Dowell, F. E.
Biological and Agricultural Engineering Department, Kansas State University, Kansas State University, USA.

ASAE/CSAE-SCGR Annual International Meeting, Toronto, Ontario, Canada, 18-21 July, 1999.

Conference Title: ASAE/CSAE-SCGR Annual International Meeting, Toronto, Ontario, Canada, 18-21 July, 1999.

9 pp.

Publication Year: 1999

Publisher: American Society of Agricultural Engineers (ASAE) -- St Joseph, USA

Language: English

Document Type: Conference paper

--
A spectral-based weed sensor was designed based on spectral characteristics of crops, weeds and *soil*. Light-insensitive *colour* indices were developed. The sensor was tested under laboratory *conditions*. The *detection* accuracy for wheat, soil and weeds (downy brome (*Bromus tectorum*), field bindweed (*Convolvulus arvensis*), Kochia...

19/3,K/3 (Item 3 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

03127429 CAB Accession Number: 950712176

Candidate high spectral resolution infrared indices for crop cover.

Malthus, T. J.; Andrieu, B.; Danson, F. M.; Jaggard, K. W.; Steven, M. D.
 Department of Physiology and Environmental Science, School of Agriculture, University of Nottingham, Loughborough, UK.
 Remote Sensing of Environment vol. 46 (2): p.204-212
 Publication Year: 1993
 ISSN: 0034-4257 --
 Language: English
 Document Type: Journal article

--
 The sensitivity of near-IR:red ratio vegetation indices to *soil* reflectance and plant *colour* result in ambiguous interpretation of plant *condition* and productivity. *Measurements* of the reflectance of sugarbeet canopies were made at high spectral resolution to investigate candidate...

... their ability to estimate foliage cover independently of the extraneous effects of variations in canopy *colour* and *soil* background brightness. Reflectances were measured with an IRIS spectroradiometer over plots of sugarbeet sown on...

... were tested for their relationship with canopy cover and their sensitivity to variations in canopy *colour* and *soil* brightness. The relationship between canopy cover and traditional near-IR:red ratio indices was found to be sensitive to both canopy *colour* and *soil* brightness. Most IR indices were insensitive to the effects of canopy colour, but those showing...

19/3,K/4 (Item 4 from file: 50)
 DIALOG(R)File 50:CAB Abstracts
 (c) 2001 CAB International. All rts. reserv.

02954636 CAB Accession Number: 951900007
Monitoring surface changes of bare soils due to slaking using spectral measurements.

Courault, D.; Bertuzzi, P.; Girard, M. C.
 Laboratoire de Science du Sol, INRA, 35042 Rennes cedex, France.
 Soil Science Society of America Journal vol. 57 (6): p.1595-1601
 Publication Year: 1993
 ISSN: 0361-5995 --
 Language: English
 Document Type: Journal article

--
 ...near-infrared reflectances for detecting these surface changes due to rainfall, and for defining optimal *conditions* for spectral *measurements*. Field experimentation was conducted using a SPOT satellite simulation radiometer. Radiometric measurements were made at...

DESCRIPTORS: *soil* *colour*;

19/3,K/5 (Item 5 from file: 50)
 DIALOG(R)File 50:CAB Abstracts
 (c) 2001 CAB International. All rts. reserv.

02764911 CAB Accession Number: 931982039
Significance of organic matter in determining soil colors.
 Schulze, D. G.; Nagel, J. L.; Scyoc, G. E. van; Henderson, T. L.; Baumgardner, M. F.; Stott, D. E.
 Purdue University, West Lafayette, Indiana, USA.

Conference Title: Soil color: proceedings of a symposium, San Antonio, Texas, 21-26 October 1990
 p.71-90
 Publication Year: 1993
 Editors: Bingham, J.M.; Ciolkosz, E.J.
 Publisher: Soil Science Society of America, Inc. -- Madison, WI, USA
 ISBN: 0-89118-802-9
 Language: English
 Document Type: Conference paper

--
 Quantitative relationships between *soil*-*colour* and organic matter content are only poorly understood, but they are of considerable practical importance...

... of various organic and inorganic fractions from the Ap horizons of four Indiana soils were *measured*. The purified humic *acid* content was about 15 times the purified fulvic-acid content for all four soils. The...

... which masked the yellowish brown colour of the fulvic acid, was responsible for the dark *colour* of the *soil* organic matter.

...DESCRIPTORS: *soil* *colour*;

19/3,K/6 (Item 6 from file: 50)
 DIALOG(R)File 50:CAB Abstracts
 (c) 2001 CAB International. All rts. reserv.

02594036 CAB Accession Number: 921969553
Seasonally saturated soils in the Puget lowland. I. Saturation, reduction, and color patterns.
 Cogger, C. G.; Kennedy, P. E.
 State Univ. Res. and Extension Cent., Puyallup, WA 98371-4998, USA.
 Soil Science vol. 153 (6): p.421-433
 Publication Year: 1992
 ISSN: 0038-075X --
 Language: English
 Document Type: Journal article

--
 ... relationship is not valid. This study was conducted to determine the relationships among seasonal saturation, *soil*-*colour* patterns, and *soil* redox in soils derived from glacial till, alluvium, and volcanic mudflow material in the Puget...

... of each parent material. Water tables, soil redox potentials, groundwater dissolved oxygen (DO), and soil *moisture* tensions were *measured* in selected soil horizons and the results compared with *soil* *colour* patterns. Seasonal high water tables could be predicted using chroma 2 colours on the glacial till and volcanic mudflow landscapes. *Soil* *colours* did not indicate current redox conditions in the alluvial sites, although they could be used...

...DESCRIPTORS: *soil* *colour*;

19/3,K/7 (Item 7 from file: 50)
 DIALOG(R)File 50:CAB Abstracts
 (c) 2001 CAB International. All rts. reserv.

02437520 CAB Accession Number: 911957340
Humus composition of soils at Mt. Taishan in China and of several major

soils in Japan.

Xi, Y. F.; Oba, Y.; Tomikawa, A.; Higashi, T.
 Shandong Agric. Univ., China.
Pedologist vol. 34 (2): p.119-127
 Publication Year: 1990
 ISSN: 0031-4064 --
 Language: Japanese Summary Language: english
 Document Type: Journal article

--
 ... soil and Mountain Shrubby-Meadow soil at Mt. Taishan in China and also from Light-*coloured* Andosol, Red-Yellow *soil* and Acid Brown Forest soil in Japan. Humus were extracted from the soils with 0...

... was determined by the Kobo and Oba method, and visible-ultraviolet absorption spectra of humic *acids* *measured*. The types of humic acids extracted from Light-*coloured* Andosol, Red-Yellow *soil* and Acid Brown Forest soil were A, Rp and P Type, resp. But the humic...

19/3,K/8 (Item 8 from file: 50)

DIALOG(R)File 50:CAB Abstracts
 (c) 2001 CAB International. All rts. reserv.

02275993 CAB Accession Number: 901945470

Characteristics and classification of red, black and yellow soils of Rajmahal Trap of Bihar.

Tiwary, J. R.; Jha, P. P.; Mishra, B. B.
 Dep. Soil Sci. and Agric. Chem., Bihar Agric. College, Sabour, Bhagalpur, Bihar 813210, India.
Journal of the Indian Society of Soil Science vol. 37 (3): p.518-523
 Publication Year: 1989
 ISSN: 0019-638X --
 Language: English
 Document Type: Journal article

--
 Red, black and yellow *coloured* *soils* occur in topographical sequence in the Rajmahal Trap of Bihar. Various morphological, physicochemical and chemical properties of these soils indicate that the topographical situation associated with different moisture and drainage *conditions* was instrumental in *determining* soil characteristics. Red soils are Alfisols, while black soils are Inceptisols, Vertisols, Entisols and Alfisols...

19/3,K/9 (Item 9 from file: 50)

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02211071 CAB Accession Number: 901940966

Determination of molecular weights of humic *acids* by osmotic pressure *measurement* and by permeation chromatography on controlled pore glass.
 Tsutsuki, K.; Kuwatsuka, S.
 Fac. Agric., Nagoya Univ., Chikusa-ku, Nagoya, 464-01 Japan.
Soil Science and Plant Nutrition vol. 35 (3): p.393-403
 Publication Year: 1989
 ISSN: 0038-0768 --
 Language: English
 Document Type: Journal article

Determination of molecular weights of humic *acids* by osmotic pressure *measurement* and by permeation chromatography on controlled pore glass.

-- Number-average molecular weights (Mn) of humic *acids* (HAs) were *determined* by osmometry and by permeation chromatography on controlled pore glass with a pore size of...

... decomposition of partially decayed bio-polymers and the increase with the formation of a dark *coloured* polymer intrinsic to *soils*.

19/3,K/10 (Item 10 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

02018311 CAB Accession Number: 881925298

The significance of gley features in soils derived from grey parent materials.

Moffat, A. J.; Jarvis, M. G.
Soil Survey of England and Wales, Rothamsted Experimental Station,
Harpenden, Hertfordshire, AL5 2JQ, UK.
Journal of Soil Science, UK vol. 39 (2): p.177-189
Publication Year: 1988 --
Language: English
Document Type: Journal article

-- ... gley features in soils derived from grey Upper Greensand rocks have been compared with their *moisture* regimes as *determined* by water-levels in dipwells. There was good correlation between the incidence of grey ped...

...DESCRIPTORS: *soil* *colour*;

19/3,K/11 (Item 11 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

01751166 CAB Accession Number: 861906066

Simultaneous *determination* of *moisture*, organic carbon, and total nitrogen by near infrared reflectance spectrophotometry.

Dalal, R. C.; Henry, R. J.
Queensland Wheat Res. Inst., P.O. Box 5282, Toowoomba 4350, Australia.
Soil Science Society of America Journal vol. 50 (1): p.120-123
Publication Year: 1986
ISSN: 0361-5995 --
Language: English
Document Type: Journal article

Simultaneous *determination* of *moisture*, organic carbon, and total nitrogen by near infrared reflectance spectrophotometry. --

... 03%), and for those with a wide range in colors. Within a narrow range in *soil* *color* and at moderate amounts of organic matter (0.3-2.5% C), the near infrared reflectance technique provides a rapid, nondestructive, and simultaneous *measurement* of *moisture*, organic C and total N in soils.

19/3,K/12 (Item 12 from file: 50)

DIALOG(R)File 50:CAB Abstracts
(c) 2001 CAB International. All rts. reserv.

01578100 CAB Accession Number: 851993938

A simple colorimetric *measurement* for humic *acids* in spodic

horizons.

Holmgren, G. G. S.; Holzhey, C. S.

National Soil Survey Lab., MNTC, SCS, USDA, Lincoln, NE 68508, USA.

Soil Science Society of America Journal vol. 48 (6): p.1374-1378

Publication Year: 1984

ISSN: 0361-5995 --

Language: English

Document Type: Journal article

A simple colorimetric *measurement* for humic *acids* in spodic horizons. --

... propanol neutralized to pH 10 with 4M acetic acid was investigated as an extractant for *soil* organic matter. The *color* of the humic acid fraction of this extract proved to be a distinctive marker of...

19/3,K/13 (Item 1 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB

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10917241 SUPPLIER NUMBER: 54256988 (USE FORMAT 7 OR 9 FOR FULL TEXT)

From Sky to Earth ... Researchers Capture "Ground Truth".

Stelljes, Kathryn Barry; Comis, Don; Wood, Marcia; Lyons-Johnson, Dawn

Agricultural Research, 47, 3, 4(1)

March, 1999

ISSN: 0002-161X LANGUAGE: English RECORD TYPE: Fulltext

WORD COUNT: 2164 LINE COUNT: 00178

... those scanned by the remote sensors, scientists are able to determine the patterns of the *soil* *color* and topography and crop growth. The researchers then analyze the patterns for clues about soil...

...Limiting Factors

ARS scientists in Lubbock and Lincoln are testing remote sensing's ability to *detect* *conditions* such as water stress and nitrogen deficiency that can reduce crop yields.

In 1998, the...

19/3,K/14 (Item 2 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB

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04598145 SUPPLIER NUMBER: 09095017 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Radiometry in monitoring plant condition.

Adams, Michael J.; Wright, Gary G.; Birnie, Richard V.

Chemistry and Industry, n9, p293(3)

May 7, 1990

ISSN: 0009-3068 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT

WORD COUNT: 2602 LINE COUNT: 00209

... with a characteristics spectrum that is clearly distinguishable from the reflection spectrum obtained from bare *soil*. Leaf *pigments* exhibit high absorption characteristics for incident visible radiation (light of wavelengths [is less than] 700nm...

...coefficient of 0.99 was observed (Fig 2). The results demonstrate that under controlled viewing *conditions*, canopy radiance *measurements* can be used to estimate ground cover in potatoes.[8]

In recent years the area...

?

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S2	420804	FRAGRANC? OR PERFUM? OR SCENT? OR ODOR? OR ODOUR? OR FRAGRANT? OR SMELL?
S3	5211496	DETER? OR PROHIBIT? OR DISSUAD? OR PREVENT? OR DISCOURAG?
S4	5789589	DETERMIN? OR DETECT? OR MEASUR?
S5	4445879	ACID? OR CONDITION? OR MOISTUR?
S6	3655782	DEER? OR ANIMAL? OR BEAR? OR GOPHER? OR VARMINT? OR GOAT?
S7	666921	SOIL OR SOILS
S8	20549	MULCH?
S9	2384	(S7 OR S8)(3N)(S1 OR S2)
S10	70153	S4(3N)S5
S11	16101	S3(3N)S6
S12	0	S9 AND S10 AND S11
S13	30	S9 AND (S10 OR S11)
S14	29	RD (unique items)
S15	1347394	(COLOR OR COLORED OR COLOUR? OR COLORING OR DYED OR PIGMENT? OR TINT OR TINTED OR TINTS OR TINTING)
S16	1465	S15(3N)(S7 OR S8)
S17	16	S16 AND (S10 OR S11)

S18 16 RD (unique items)
S19 14 S18 NOT PD=000223:011106
S20 499 S2(3N) (S7 OR S8)
S21 3 S20 AND (S10 OR S11)
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21/3,K/1 (Item 1 from file: 148)
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June 30, 2001

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RECORD TYPE: Fulltext

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21/3,K/2 (Item 2 from file: 148)
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10915271 SUPPLIER NUMBER: 54260310 (USE FORMAT 7 OR 9 FOR FULL TEXT)

OECD economic surveys: 1998-1999. (includes related articles on the 1998
 fiscal developments, 1999 budget, 1992 tax reform, sustainable
 development, Kyoto protocol) (Organization for Economic Co-operation and
 Development)

OECD Economic Surveys - Norway, 9(1)

Feb, 1999

LANGUAGE: English RECORD TYPE: Fulltext
 WORD COUNT: 46082 LINE COUNT: 03714

... be achieved by combining an increase of the tax on nitrogen
 fertilisers with specific agronomic *measures* adapted to local
 conditions. (86)

Local environmental problems

Norway is privileged by its geographical situation which, together
 with a...

...pollute water, soil and air. Waste deposited in landfills causes
 leakages into groundwater and the *soil*, *smell*, and generates emission
 of methane and other damaging gases. The incineration of waste, moreover,
 generates...

21/3,K/3 (Item 3 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB
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03933525 SUPPLIER NUMBER: 06953924 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Learning the language of wine.

Restaurants & Institutions, v99, n1, p153(2)

Jan 9, 1989

ISSN: 0273-5520 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT

WORD COUNT: 1206 LINE COUNT: 00093

... citric is often present. The fruit acids in wine give it liveliness when in balance. *Acids* are *measured* in the must by pH, denoting the intensity of the acidity, and are important in...

...balanced, with finesse, a truly fine wine. Earthy: Often associated with grapes grown in heavy *soils*. It is the *smell* and imaginary taste of fresh earth. Finesse: Having harmony and balance; high quality. Finish: Aftertaste...

?

MAIL-IT REQUESTED: NOVEMBER 5, 2001

100J1V

CLIENT: 09769076
LIBRARY: NEWS
FILE: ALLNWS

YOUR SEARCH REQUEST AT THE TIME THIS MAIL-IT WAS REQUESTED:
(DYED OR TINTED) W/5 (SOIL OR SOILS OR MULCH)

NUMBER OF STORIES FOUND WITH YOUR REQUEST THROUGH:
LEVEL 1... 124

LEVEL 1 PRINTED

THE SELECTED STORY NUMBERS:
~~47,51,52,56,65,75,919~~

DISPLAY FORMAT: FULL

SEND TO: LEHMAN, KAREN
PATENT & TRADEMARK OFFICE
1911 S CLARK ST
ARLINGTON VIRGINIA 22202-3503

*****09726*****
**

Copyright 1999 The Christchurch Press Company Limited
The Press (Christchurch)

April 3, 1999

SECTION: FEATURES; GARDENING;

Pg. 18;

TOP TIPS WEEKEND GARDENING; WE

LENGTH: 88 words

HEADLINE: TOP TIPS

BODY:

Reduce the need for spring and summer spraying of fruit trees to control diseases by copper spraying them now to lessen black spot.

Also, pick off mummified fruit, blast-deformed twigs, or gummy shoots.

Silverbeet loves salt in its soil. Dig seaweed into the ground about 15cm down, or give young plants a dressing of common salt.

Dyed mulches is becoming popular in the United States. The colours, which are environmentally safe and do not alter soil pH, are designed to provide a fresh look for several seasons.

LOAD-DATE: April 7, 1999

January 28, 1999, Thursday, Final Edition

SECTION: HOME; Pg. T27; TIP OF THE WEEK

LENGTH: 741 words

HEADLINE: A Fresh Slant On Sunflowers

BYLINE: Charles Fenyvesi

BODY:

Have you been losing some of the moisture released by melting snow, along with fine topsoil that runs off a slope? Are winds contributing to your losses?

To capture moisture and to retain topsoil, U.S. Department of Agriculture research scientists have come up with a recommendation, directed at farmers in the central Great Plains but applicable to gardeners in our metropolitan area. The scientists found that leaving dead sunflower stalks as high as 30 inches, instead of removing them, "almost completely prevents soil from being blown away." Stalks trap three to 10 times more snow than accumulates on bare fields. For those who grow sunflowers or are fond of them, the next finding is useful: Trapped snow replenishes 3 to 9 inches of moisture depleted during a growing season by ever-thirsty sunflowers.

Many gardeners plant familiar giant sunflowers for their beauty and for their seeds, so good for humans and for birds. Others recently have discovered the amazing diversity, in color and bloom structure, of the new series of sunflowers.

Nature fans allow the birds to take seeds as they mature; others wrap flowerheads in paper bags to preserve the seed for later use. Once they are windblown or killed by frost, the plants usually are pulled, roots and all.

But perhaps next time it would be a good idea not to be so neat, leaving roots and lower stalks. A forest of leafless gray-brown stalks, stout and straight and perhaps cut off at the same height, will not look offensive. To the contrary, once we think of them as a combination snow fence, erosion deterrent and wind barrier, we may learn to like the way they look. If left in place, pull them in February or March, and sow new seeds in May.

The principle can apply to other plants. Fans of ornamental grasses like to keep them through the winter. We may experiment ourselves and leave some annuals in place during winter. The dried-up skeletons of such summer ghosts as nicotiana and petunia, cosmos and zinnia too are likely to have at least some useful properties that scientists have identified in sunflowers. In spring, pull them up and toss on the compost pile.

Another promising entry, for those of us who do not like to spray fruit trees, is a large, sweet, fragrant blackberry hybrid known as Triple Crown. It has been in the works for 10 years, was released commercially by the USDA in 1996 and is now available from specialty nurseries, including Nourse Farms Inc., South Deerfield, Mass. (413-665-2658) and Cedar Valley Nursery, Centralia, Wash. (360-736-7490).

The cultivar deserves the crown in three categories: flavor, productivity and vigor. This latest superior blackberry that USDA takes credit for has been tested successfully in the Mid-Atlantic region as well. In Oregon, trials have shown that 8-year-old Triple Crown plants yield at least 30 pounds of berries per plant. When it comes to flavor, color and overall quality for use in pies and preserves, Triple Crown rated equal to the popular Chester Thornless and Marion blackberries.

Blackberries do well in our clay-dominated soil, though they do best when soil is improved with plenty of organic content. They can take some shade, though at a loss to yield. To plant them in April, we have to choose a cultivar, find a nursery and order stock soon, which is a good thought to take us out of the dumps of February.

One more USDA research project summarized in the "Quarterly Report"--which makes for good reading during winter and is available on the Internet at www.ars.usda.gov/is/--deals with the apparently increasingly popular product known as "pine straw mulch." The mulch comes in dyed versions that impart a fresh mulch look over several seasons.

Scientists determined that colorants are environmentally safe and do not alter soil pH, as feared. The mulch also decomposes more slowly than uncolored mulch, and that is appreciated by gardeners who do not like the expense and effort of spreading a fresh layer every year or so.

TIP OF THE WEEK

EXAMINE ICE-DAMAGED trees and shrubs. Snapped branches should be pruned to accelerate healing and minimize disease. Remove a stem back to the nearest branch (which should be at least one-third the diameter of the broken one) or to the branch collar where it joins the trunk, said Andrew Gerachis, of the Loudoun County Extension Office. Leave high or heavy branches to a reputable tree professional.

GRAPHIC: Symbol

LOAD-DATE: January 28, 1999

Copyright 1999 The Omaha World-Herald Company
Omaha World-Herald

January 24, 1999, Sunday SUNRISE EDITION

SECTION: ;NEWS;

Pg. 3b

LENGTH: 864 words

HEADLINE: Locally Made Composts Help Soil, Creighton Tests Show

BYLINE: Julie Anderson

SOURCE: World-Herald Staff Writer

BODY:

Recent tests by a Creighton University team have shown the value of using locally produced recycled products to improve soil in urban areas.

Mary Ann Vinton, an assistant professor of biology at Creighton, put Omagro, the City of Omaha's compost, and a ground corncob mulch called Cob Cover, to the test last summer on an empty lot at 38th and Parker Streets in the Orchard Hill neighborhood.

The tests were a project of City Sprouts, an organization promoting urban community gardening, with \$12,800 in funding from the Nebraska Environmental Trust, which receives a share of state lottery proceeds.

The lot is owned by the Orchard Hill Neighborhood Association, which plans to start a community garden there this summer. The Orchard Hill garden will be the second one City Sprouts has helped develop in Omaha. Working with Vinton were Creighton students Rebecca House and Therese Pogge.

Vinton said the city's compost, made from the leaves, sticks and grass clippings Omahans leave on their curbs, really stimulated microbial activity. That means the bugs broke down nitrogen in the soil into a form plants could use, providing them with the food they need to grow.

The researchers also tested a not-quite-finished batch of compost. With such a mix, microbes sometimes can become too active and use up all the nitrogen themselves. But that wasn't the case with this particular compost.

Compost typically is used for improving poor soil. In the Omaha area, soils tend to be fine, silty and clayish. But making such soils even with compost can take time, even three to four years, she said.

Cob Cover, the ground corncobs, does not contain nitrogen, so it doesn't make a good fertilizer, Vinton said. But it worked well for increasing soil moisture and breaking up clay soils.

Kurt Christensen, who sells Cob Cover, said the researchers tested a finely ground version of the product that can be tilled into the soil. The company also makes a less finely ground product that can be used as a mulch. The mulch comes in nine colors, dyed with long-lasting natural dyes, and provides an alternative to wood mulch.

Christensen said he has been selling Cob Cover about three years, buying the cobs from area farmers. Each acre of corn yields about a ton of cobs, usually a waste product. He received a grant from the U.S. Department of Agriculture to develop the product, which is available in garden stores.

Workshop Today

The Lincoln Green Building Group has scheduled a workshop for today to discuss sustainable development concepts and how they can benefit the community and to share how green building practices can be used in new construction and remodeling.

The workshop, free and open to the public, will be from 1:30 p.m. to 3 p.m. at Payless Cashways north store, 3901 N. 27th St. in Lincoln.

Joyce Coppinger of Re:Build Associates, a group member, said the organization formed more than a year ago and is working to make people more aware of its efforts.

Orchid Show

It's a bit of a haul to get there from here, but for true orchid aficionados, a jaunt to St. Louis for the Missouri Botanical Garden's annual orchid show Jan. 30 through March 14 should be worth the trip.

The 75-year-old show features the garden's award-winning collection, one of the largest and most varied in North America.

Orchids number more than 20,000 species, making them one of the world's largest families of plants. The garden has about 10,000 plants representing about 3,500 species, varieties and hybrids, including many rare species that are endangered or extinct in the wild.

The show is open daily from 9 a.m. to 5 p.m. Admission is \$2 for visitors age 13 to 64 and \$1 for those 65 and over. Members and children 12 and younger get in free. Visitors also pay regular garden admission of \$5 for ages 13 to 65 and \$3 for those 65 and over. For more information, call (314) 577-9400.

Funds for Wildlife

A measure that would set aside a share of federal oil and gas revenues for state wildlife programs covering species not hunted or fished was reintroduced in the U.S. Senate last week.

A version is expected to be introduced in the House of Representatives soon, according to the International Association of Fish and Wildlife Agencies. Both bills were first introduced last October, assigning 10 percent in the House version and 7 percent in the Senate of an expected \$4 billion to \$5 billion for wildlife conservation.

Turning over a chunk of the offshore leases appears to be the best available chance for states to get additional funding for nongame wildlife programs, some wildlife officials have said.

Currently, those programs are funded largely through income tax checkoffs. But receipts from those checkoffs have dwindled in recent years for both Nebraska and Iowa. Nebraska could get \$4.2 million a year under the program, although it would have to provide some matching funds.

A coalition of wildlife agencies, outdoor companies and others called Teaming With Wildlife has pushed for additional funds for nongame wildlife programs.

LOAD-DATE: January 24, 1999

Copyright 1995 Boston Herald Inc.
The Boston Herald

July 16, 1995 Sunday SECOND EDITION

SECTION: LIFESTYLE;

Pg. 053

LENGTH: 435 words

HEADLINE: DIRT-CHEAP GARDENER; You'll thank mulch very much as a plantings cover

BYLINE: By Andy Tomolonis

BODY:

Beat the summer heat, save water, reduce weeds and give your garden a uniform, well-groomed look - all with one product: mulch.

A dressing of mulch fights off the desiccating summer sun, helping to keep the soil moist. It also blocks out sunlight, which weed seeds need to germinate. Finally, it adds a consistent background for flower beds, trees and shrub plantings, said David Smiley, horticultural salesman at Weston Nurseries in Hopkinton. Choose a mulch that will provide a color and texture that suits your landscape.

Some ideas:

Wood chips: One of the least expensive mulches, wood chips are usually a coarse mixture of ground-up branches and sawmill debris. Wood chips are golden brown when new but in a few months turn a silvery gray. Though chips are best for covering a large area to keep down weeds, they are somewhat coarse for a foundation planting.

Pine bark mulch: This is the next step up from wood chips. It's dark brown when new and has a pleasant pine-tar smell. Pine mulch also fades into a silvery color after one season. It's made from bark stripped off trees at sawmills. Processors shred the bark, which provides an even cover that's fine for most foundation plantings and flower beds.

Red hemlock mulch: When fresh, hemlock mulch has a rust-red tint with a texture fine enough to spread around tight spots between plants. It's about 25 percent more expensive than pine bark mulch, but many gardeners prefer its appearance and scent. After about six months, the red fades.

~~Recycled, dyed wood mulch: This new mulch~~ - made from recycled oak shipping pallets - looks like prime red hemlock from a distance. A closer examination, however, reveals that there is no bark at all. It's made by several companies in New England, and texture varies depending on how and where it's made.

Fred Morris, marketing director of COMSHIP Corp. in Springfield, said his company's product, Heartwood, is made from clean, recycled pallets that are pulverized, screened and dyed with brick-red or hemlock-colored pigments. The non-toxic dyes are applied to dry wood, ensuring that the color drinks in and lasts through two seasons.

Consider spreading a weed-blocking cloth beneath the mulch - especially in large, sunny spots. Black plastic will work, but the best weed-blockers are porous, enabling water to pass through to the soil. The ground cloths will ensure that no weeds force their way through thin spots in the mulch.

The ideal depth for mulches is about 3 inches. Thinner spots will let weeds grow through, and thicker depths can suffocate the plants you're trying to protect.

DATE: NOVEMBER 5, 2001

CLIENT: 09769076
LIBRARY: NEWS
FILE: ALLNWS

YOUR SEARCH REQUEST IS:

DATE BEF 2/23/00 AND (FRAGRANT! OR FRAGRANCE OR PERFUM! OR SCENTED) W/5
(MULCH! OR SOIL!)

YOUR FOCUS SEARCH REQUEST IS:

(DEER OR ANIMAL OR BEAR) AND (SCENTED OR PERFUM! OR FRAGRANC!)

NUMBER OF STORIES FOUND WITH YOUR FOCUS REQUEST:

66

Copyright 1999 The Baltimore Sun Company
THE BALTIMORE SUN

May 22, 1999, Saturday ,FINAL

SECTION: LOCAL

,1B

LENGTH: 819 words

HEADLINE: Grazing deer get a taste of gardeners' frustration; Hot sauce, soap part of residents' arsenals

BYLINE: Melody Simmons

SOURCE: SUN STAFF

BODY:

~~Desperate to keep marauding deer from treating their plants like canapes, gardeners in the area are shaving pungent deodorant soap, blasting country music all night and decorating freshly tilled soil with cotton puffs soaked in coyote urine.~~

"This year I planted 50 tulips in exotic colors," said Mary Bobnar, a nurse who lives in Ellicott City. "And the deer waited until the night before they bloomed, came through and pulled them up by the roots and ate every one. They even ate the leaves."

Some gardeners in the region douse their fledgling tomato plants in Tabasco sauce or dust them with cayenne pepper, which are rumored to give deer a four-alarm jolt. Still others raid barber shops for clippings of men's hair -- preferred over women's because it is washed less, they say -- to sprinkle around the rim of the garden.

Bobnar has opted to deodorize her yard.

Shaved bars of Irish Spring soap, whittled with a potato peeler, have been mixed into her mulch this season after rumors spread over the backyard fence that the strong pine scent is enough to turn deer away.

Some who surrendered

One of her neighbors played country music outside all night, hoping the twang would do the trick. "It didn't work -- and now I hear he's given up gardening altogether," she said.

So has Steve Pusateri. This year, he placed plastic red, white and pink flowers in his Howard County back yard "because we were spending hundreds of dollars in bedding plants that were nothing but deer food."

"When my mother did that I used to think it was tacky," Pusateri said. "But I got tired of them eating all of our stuff."

W. Sherard Wilson, 92, put a \$600 electric fence in the back yard of his Ellicott City development -- deer have devoured 100 azalea bushes on his property since 1996. Surrounded by homes that sell between \$194,000 and \$299,000, Wilson's fence is a conversation piece, but he says it hasn't worked each time.

"Ten years ago, we used to look out the window and see one deer and say, 'What a beautiful little thing,'" Wilson said. "Now when you look out, you see 11 to 13 of them chewing on your plants and you're not too happy."

Wild deer today total a record 300,000 in Maryland, state Department of Natural Resources officials say.

With their former habitat replaced by townhouse sprawl, most **deer** graze through backyard gardens as a means to survive, said Doug Hotton, leader of DNR's **Deer** Project, which monitors the **animals** in the state.

And that's where the battle begins.

"If there's not a lot of repellent, they can strip your trees pretty well," said Bill Roesch, who works at Metzler's Garden Center in Eldersburg. "It's a big problem. some people are desperate."

Roesch lectures homeowners on how to keep **deer** at bay with whimsically named repellents such as Foggy Mountain, a \$12.99 jar of coyote urine with a predatory scent that is supposed to shoo **deer** away; Tree Guard, a \$44.99-per-gallon chemical spray; and "RoPel," another chemical spray for trees and shrubs.

He advises gardeners to plant certain trees, bulbs, shrubs and perennials that **deer** typically won't bother: Colorado blue spruce, dragon lady holly, daffodils, lily of the valley, boxwood, lavender, bleeding heart and yarrow.

"Then there is the electric fence," he says, "and aluminum plates placed on sticks that rattle and flash."

Losses to farmers

David Greene, a Carroll County extension agent for the University of Maryland's agricultural sciences department, said **deer** cost farmers a lot every year.

"In Carroll County, it's mostly the farmers that have lost crops like corn, soy and wheat to **deer**," Greene said. "It's an estimated \$38 million loss -- and that's not chicken feed. That's a direct loss to the farmer."

In more suburban counties such as Howard and Baltimore, herds of **deer** that total up to 50 fearlessly saunter through subdivisions in search of vegetables and flowers, he said. Many wander onto porches and sun decks to devour the neat, colorful contents of a window box or planter.

"They just decimate the landscape and then move on," Greene said.

Deer Busters, a Frederick mail-order business, offers more than 80 **animal** repellents ranging from \$19.95 to \$79.95. "We are booming at this time," said saleswoman Kathy Myers. The 5-year-old company just mailed 19,000 catalogs nationwide.

"Most people start to worry about their gardens when the **deer** start to come in," Myers said.

On the Internet, discussion groups such as **Deer** Mail and **Deer**.com allow for commiseration, while Web sites such as www.nottonightdeer.com offer products.

"All our customers are having trouble -- they are eating everything down to the bone," said Etta Cox of the Horizon Nursery and Garden Center in Freeland, just south of the Mason- Dixon line.

"They are worse than rabbits and there's only one way to get rid of them. Hunting."

GRAPHIC: PHOTO(S) 1. Gardener: Mary Bobnar of Ellicott City whittles a bar of Irish Spring soap and mixes the shavings into her garden's mulch. The deodorant soap's ~~fragrance~~ is meant to ward off **deer**, which ate her tulips this year. "They even ate the leaves," she says.

2. Precaution: Mary Bobnar whittles bars of Irish Spring soap with a potato peeler and mixes the shavings into mulch to ward off **deer**.

LOAD-DATE: May 24, 1999

DATE: NOVEMBER 5, 2001

CLIENT: 09769076

LIBRARY: NEWS

FILE: ALLNWS

YOUR SEARCH REQUEST IS:

(DYED OR TINTED) W/5 (SOIL OR SOILS OR MULCH)

NUMBER OF STORIES FOUND WITH YOUR REQUEST THROUGH:

LEVEL 1... 124

Copyright 1999 The Dallas Morning News
The Dallas Morning News

July 2, 1999, Friday THIRD EDITION

SECTION: HOUSE & GARDEN;

Pg. 5G

LENGTH: 258 words

HEADLINE: Mulch madness is spreading

SOURCE: The Baltimore Sun

BYLINE: Susan Reimer

BODY:

Mulch used to be the finishing touch on the razor-cut flower beds of the rich. But now everybody mulches.

Mulch is one of those miserable tasks that homeowners dread beginning because, once you start mulching, you can't quit until the last load in your driveway or the last bag is emptied.

Some gardeners mulch twice a year - once in spring to protect plants from the heat and again in the fall to protect them from the cold.

Other gardeners hope to mulch once and never again. They are the ones who blanket their flower beds with stone, crushed brick, oyster shells, marble chips, lava rock and - heaven save us - black plastic.

Now, in the spirit of creating a need where none before existed, mulch producers, not content to pressure suburbanites into heaping hundreds of dollars worth of inert tree waste on their yards in the name of neatness and uniformity, have created novelty mulches.

They come in a variety of colors and scents, perfect for those of us who were shocked to learn that mushroom manure we distribute with our bare hands is not recycled Portobello and shiitake mushrooms.

Producers are grinding old wood pallets into mulch and dying the result. That's the brilliant red mulch you are seeing this summer.

And you can now purchase a mulch made of cocoa bean shells that smells of chocolate.

"It's wonderful," says Bruce Butterfield of the National Gardening Association, who used it this year.

"But the next morning I found four raccoons in my garden digging like mad, trying to find the candy bars."

GRAPHIC: PHOTO(S): (The Dallas Morning News: Karen Stallwood) Most people dread mulching twice each year.
But now dyed and scented varieties of mulch are available.

LOAD-DATE: July 2, 1999

Copyright 1999 The News and Observer
The News and Observer (Raleigh, NC)

May 13, 1999 Thursday, FINAL EDITION

SECTION: NEWS;

Pg. B4

LENGTH: 536 words

HEADLINE: Fire destroys Butner mulch plant

BYLINE: JEN GOMEZ, STAFF WRITER

BODY:

BUTNER -- A spectacular blaze ripped through a mulch-producing plant early Wednesday, leaving stacks of lumber and wooden pallets in huge piles of ashes.

No one was injured, but damages were estimated at \$3 million. The cause had not been determined.

The intense flames were first seen about 4 a.m. by a worker who lives a quarter of a mile from Southern Pallet Inc., which has three plants on 30 acres of land.

The Butner Public Safety Department and several volunteer fire departments began battling the blaze shortly after 5 a.m.

Flames were shooting through the roof and thick clouds of smoke billowed from the mulch plant, which is at 1123 Wilkins Road, authorities said.

"It just went up like a ball of fire," said Tony Fogleman, general manager at Southern Pallet, an 18-year-old business.

The company prides itself on recycling wooden pallets, cardboard boxes, nails and other materials.

A 130-employee operation, Southern Pallet also processes lumber and pallets into mulch, some of which is dyed red and brown.

Flammable chemicals didn't pose a threat at the mulch plant, because it uses only environmentally friendly materials, Fogleman said.

No one was working when the fire broke out. The man who first saw the fire, a mechanic, was getting ready for work at the time, Fogleman said.

Several crews of about 50 firefighters doused the fire for six hours before containing the flames, authorities said. They faced a serious threat as propane tanks on the heavy machinery inside the plant could have exploded in the heat.

Wayne Elms, director of Butner's Public Safety Department, said the cause of the fire was undetermined because the fire was still smoldering and firefighters were knocking out hot spots that flared.

Fire investigators expect to get inside the 22,000-square-foot building sometime today.

The flames swallowed the metal structure, devouring lumber, mulch and wooden pallets. It also damaged heavy machinery, such as tow motors, a forklift and loaders.

The roof was torn apart and the walls caved in, Fogleman said.

The 10 employees who worked in the plant will keep busy loading and shipping undamaged stockpiles of mulch.

"We'll recover from it," he said. "It's a major problem, but at the same time we have the equipment and manpower to offset it."

Still, the bagging portion of the mulch business will not be running for the remainder of the year.

Southern Pallet bought the Butner buildings five years ago, and started doing mulching two years later, Fogleman said.

The main plant is at 010-26th St., about 20 acres from the building that caught fire.

The scorched shell of the mulch plant was still under watch Wednesday night. Crews of firefighters soaked the burned remains to put out small bursts of flames.

Elms said they used five or six water tankers, filled with up to 2,000 gallons of water each, because the fire hydrants were supplying a low volume of water.

With fire investigators waiting to learn what started the blaze, Fogleman said it appears a loader might be to blame. He said it was badly burned and a short in the starter or alternator could have sparked the fire.

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News researcher Charles de Bose contributed to this report.

GRAPHIC: photo Firefighters reduce a fire at a Southern Pallet Inc. plant in Butner to clouds of smoke, but there were problems with hot spots flaring and the danger of propane tank explosions. The fire, which might have been linked to a loader, took six hours to contain, but there were no injuries. Flames were seen coming from the building about 4 a.m. Wednesday. Photo By Julian Harrison For The News & Observer

LOAD-DATE: May 13, 1999